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ABSTRACT

An evaluation was made of an educational television series called "Infinity Factory." The series was designed to teach elementary school children various math skills useful in everyday life. This volume consists of the appendixes to the evaluation report. It includes abstracts of the analysis of the first eight shows, pretest/posttest instruments, various rating scales and questionnaires, and the raw data that were used in the evaluation. Program guides for the eight shows that were studied are also included. (JY)

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EVALUATION OF EIGHT "INFINITY FACTORY" PROGRAMS

APPENDICES

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June, 1976

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ABSTRACTS OF PART II: SHOW-BY-SHOW ANALYSES

SHOWS A TO H

ABSTRACT

Show A: Evaluation Report

The math topic for Show A is measurement of time. Data were collected from 840 students in 39 classes, and from 37 of the 39 teachers.

The mean percentage of attention for the show overall was quite high (93%). Attention dropped off considerably only during the second "Math in the Street" segment.

All mean student appeal ratings were above 2.25 on a 3-point scale. The show overall was rated higher than separate segments; "Scoops' Place" was rated lowest. Black students rated the show overall higher than non-target students, but they rated "Scoops' Place" lower than either Latino or non-target students. Girls rated "Brownstone" segments and "City Flats" higher than boys. No age differences were noted.

Most teachers (76%) considered the show educationally effective; 89% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention(93%), Language(87%), and Math Attitudes (84%) Subscales; and lowest on the Social Attitudes(73%), Program Guides(70%), and Math Content(62%) Subscales. Areas which teachers specified as needing improvement were: voices(38%), math content(32%), and language(24%).

Twenty classes engaged in related activities before and/or after the show. Most of these (76%) were discussions and most (80%) dealt with the math content of the show.

ABSTRACT

Show B: Evaluation Report

The math topics for Show B are rounding off and approximation. Data were collected from 801 students in 39 classes, and from 37 of the 39 teachers.

The overall mean percentage of attention for Show B was 93%. Attention declined only during the historical segment.

All student mean appeal ratings were above 2.53 on a 3-point scale. Students rated the show overall higher than any of the four segments in Show B. There were no differences among ethnic groups in the appeal of "City Flats." Black students rated all other segments higher than Latino and non-target students. Girls rated the show overall, "Brownstone" segments, and "Scoops' Place" higher than boys. There were no other differences between boys and girls, or between age groups.

Most teachers (84%) considered the show educationally effective; 92% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention (92%), Math Attitudes (87%), Math Content (85%), Language (85%), and Program Appeal (84%) Subscales; and lowest on the Technical Reception (76%), Social Attitudes (75%), and Program Guides (71%) Subscales. Areas which teachers specified as needing improvement were: voices (35%), more visuals (27%), math content (27%), and Program Guide (24%).

Twenty-one classes engaged in related activities before and/or after the show. Most of these were discussions; most of these (86%) dealt with the math content, although a considerable number (43%) dealt with cultural or social areas of the show.

ABSTRACT

Show C: Evaluation Report

The math topic for Show C is measurement of weight. Data were collected from 820 students in 38 classes, and from 38 teachers. Twelve classes (31% of the sample) reported audio or video problems.

Overall attention for Show C was quite high (89%), but lower than for previous shows. Some of the decline in attention could be attributed to the 12 classes (31%) who reported audio or video reception problems. Attention declined during the film documentary and the second "Math in the Street" segment.

Student appeal ratings were quite high (all were above 2.47 on a 3-point scale). Students rated "City Flats" substantially lower than "Scoops' Place" or animation. Black students' mean appeal ratings were higher than non-target students' for all areas except animation, where there was no difference.

Fewer teachers (63%) rated Show C educationally effective; 64% rated the overall presentation good or outstanding. Show C was rated lower than all other shows on all subscales except the Math Content Subscale and Student Attention Subscales, and was rated lower than most shows on those two subscales. Program Guides and Social Attitudes were rated relatively lower than other areas. Areas which teachers specified as needing improvement were: voices (34%), math content (32%), language (29%), and more visuals (24%).

Seventeen classes engaged in related activities before and/or after the show. Nearly all of these were discussions, and nearly all dealt exclusively with the math content.

ABSTRACT

Show D: Evaluation Report

The math topic for Show D is mapping and scaling. Data were collected from 834 students in 39 classes, and from 37 of the 39 teachers.

The mean percentage of attention for Show D was 91%. Attention declined during "Scoops' Place" and during the historical segment.

Mean appeal ratings for all student groups were above 2.43 on a 3-point scale. Students rated the show overall and animation segments higher than "Scoops' Place" or "City Flats." Black students rated all areas higher than non-target students, and Latino students rated all areas but "City Flats" and animation higher than non-target students. Girls rated the show overall and "Brownstone" segments higher than boys. There were no other differences between boys and girls, or between age groups.

Fewer teachers (60%) rated Show D educationally effective; 70% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Language (85%), Technical Reception (81%), and Math Attitudes (81%) Subscales; and lowest on the Program Guide (72%), Student Appeal (71%), Social Attitudes (69%), and Math Content (65%) Subscales. Areas which teachers specified as needing improvement were: language (22%), voices (22%), more visuals (22%), and math content (24%).

Twenty classes engaged in related activities before and/or after the show. Most of these (79%) were discussions; 75% dealt with the math content, and 15% dealt with cultural or social ideas.

ABSTRACT

Show E: Evaluation Report

The math topic for Show E is graphing. Data were collected from 724 students in 37 classes, and from 35 of the 37 teachers.

The mean percentage of attention for Show E was 91%. Attention declined during the historical segment, and there was a substantial downward trend in attention over the four "Math Fact" segments.

Mean appeal ratings for all groups were above 2.37 on a 3-point scale. All five areas were rated about equally. Black and Latino students rated the "Brownstone" segments higher than non-target students. "Scoops' Place" was rated higher by Black students than by non-target students, and higher by older than by younger students. Girls rated the show overall higher than boys. There were no other substantial differences among ethnic groups, ages, or sexes.

Most teachers (80%) rated Show E educationally effective; 77% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention (90%) and Language (89%) Subscales, and lowest on the Program Guide Subscale (69%). All other subscales were rated equally (81%). Areas which teachers specified as needing improvement were: voices (20%), more visuals (20%), and math content (17%).

Fifteen classes (44%) engaged in related activities before and/or after Show E, fewer than in previous weeks. Although most of these (87%) dealt with math content, the relative percentage of those dealing with cultural or social areas (27%) increased over previous shows.

ABSTRACT

Show F: Evaluation Report

The math topic for Show F is estimation of quantity. Data were collected from 782 students in 39 classes, and from 35 of the 39 teachers.

The mean percentage of attention for Show F was 90%. Attention declined during the film documentary and historical segment.

Mean appeal ratings for all areas and for all student groups were above 2.48 on a 3-point scale. Girls rated the "Brownstone" segments, "City Flats," and "Scoops' Place" higher than boys. Younger students rated "Brownstone" segments higher than older students. Black students rated the show overall and "Scoops' Place" higher than non-target students. Black and Latino students rated "Brownstone" segments higher than non-target students.

Most teachers (74%) rated Show F educationally effective; 77% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Student Attention (93%), Language (90%), and Program Presentation (82%) Subscales; and lowest on the Math Content (73%), Social Attitudes (67%), and Program Guides (60%) Subscales. Areas which teachers specified as needing improvement were: math content (26%), voices (17%), Program Guides (17%), and more visuals (14%).

Thirteen classes (31%) engaged in related activities before and/or after Show F, a decline from previous shows. Most of these (92%) dealt with the math content; only one dealt with social or cultural areas of the show.

ABSTRACT

Show G: Evaluation Report

The math topic for Show G is measurement of weight. Data were collected from 784 students in 39 classes, and from 35 of the 39 teachers.

The mean percentage of attention for Show G was 89%. Attention declined during the historical segment; there were downward trends in attention over the two "Math in the Street" segments and over the four "Math Fact" segments in show G.

Mean appeal ratings for all areas and for all student groups were above 2.16 on a 3-point scale. All groups rated animation segments equally. Girls rated the other four areas higher than boys, and Latino students rated the other four areas higher than non-target students. Black students rated the show overall, "Brownstone" segments, and "Scoops' Place" higher than non-target students. Ratings for the show overall were higher for younger than for older students; there were no other age differences.

Fewer teachers (67%) rated Show G educationally effective; 62% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Language (88%), Technical Reception (81%), and Math Attitudes (81%) Subscales; and lowest on the Program Presentation (74%), Social Attitudes (73%), and Program Guides (62%) Subscales. Areas which teachers specified as needing improvement included: more visuals (28%), math content (25%), voices (25%), and dramatizations (19%).

Fifteen classes engaged in related acivities before and/or after Show G. Most of these were discussions, and only one teacher dealt with cultural or social aspects of the show.

ABSTRACT

Show H: Evaluation Report

The math topic for Show H is mapping and scaling. Data were collected from 817 students in 38 classes, and from 37 of the 38 teachers.

The mean percentage of attention for the show overall was quite high (92%), and declined slightly only during the historical segment.

Mean appeal ratings for all student groups were above 2.23 on a 3-point scale for all five areas. The mean rating for the "Brownstone" segments was lower than any other area. There were no differences among ethnic groups, ages, or boys and girls on appeal ratings for "City Flats" and animation segments. Black students rated the "Brownstone" segments higher than Latino and non-target students, and they rated "Scoops' Place" higher than Latino students. Girls rated the show overall, "Brownstone" segments, and "Scoops' Place" higher than boys. Younger students rated the "Brownstone" segments higher than older students.

Most teachers (78%) rated Show H educationally effective; 92% rated the overall presentation good or outstanding. Teachers' ratings were highest on the Language (91%), Technical Reception (89%), and Student Attention (85% Subscales; and lowest on the Social Attitudes (76%), Math Content (72%), and Grogram Guide (53%) Subscales. Areas which teachers specified as needing improvement included: math content (22%), more action (22%), and more visuals (19%).

Fifteen classes engaged in related activities before and/or after Show H. Of these, 93% dealt with the math content, and 20% dealt with social or cultural aspects of the show.

APPENDIX B

PRETEST/POSTTEST INSTRUMENTS

STUDENT ATTITUDE FORM (PRETEST/POSTTEST)
STUDENT MATH CONTENT FORM (PRETEST/POSTTEST)
TEACHER SEMANTIC DIFFERENTIAL (PRETEST/POSTTEST)
TEACHER OPINION FORM (POSTTEST ONLY)

S/A/

STUDENT ATTITUDE FORM (PRETEST/POSTTEST)

NAME ______________________ DATE ______________________

	EXCITING (1)	BORING (2)	FUN (3)	NO FUN (4)	DON'T LIKE (5)	LIKE (6)	EASY (7)	HARD (8)	GOOD (9)	NO GOOD (10)
(A) TELEVISION	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) MATH	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) TELEVISION PROGRAMS ON MATH	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

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S/A/
(side 2)

STUDENT ATTITUDE FORM (PRETEST/POSTTEST)

CIRCLE YES OR NO

1. I think it's OK for girls to be on boys' sports teams.	YES	NO
2. Sometimes kids can fix things as well as grown-ups.	YES	NO
3. There are many different ways to use math.	YES	NO
4. I would like to learn more Spanish words.	YES	NO
5. Television programs could help me get along with different kinds of kids.	YES	NO
6. I think it's OK for boys to wash dishes.	YES	NO
7. Grown-ups always know the right answers.	YES	NO
8. Some television shows make me feel good about who I am.	YES	NO
9. Math is my favorite subject.	YES	NO
10. I would like to have friends who are different from me.	YES	NO
11. The only time I use math is in school.	YES	NO
12. I talk about television programs with my friends.	YES	NO
13. Boys do everything well.	YES	NO
14. I think grown-ups could learn some things from me.	YES	NO
15. I would rather watch a math television program than cartoons.	YES	NO

STUDENT MATH CONTENT FORM (PRETEST/POSTTEST) s/C/

NAME________________________

CIRCLE YES OR NO

1.	A graph is like a picture of how things change.	YES	NO
2.	You can get along all right without knowing how to read a clock.	YES	NO
3.	37 is closer to 30 than it is to 40.	YES	NO
4.	You can use estimation when it doesn't matter exactly how much you have.	YES	NO
5.	A bicycle weighs about one kilogram.	YES	NO
6.	You can find out how far you have to go by using the scale on a map.	YES	NO
7.	If you are working in a store it's OK to estimate the customer's change.	YES	NO
8.	You can use scaling to find out what color to paint something.	YES	NO
9.	You can count off seconds by saying, "one thousand and one, one thousand and two..." and so forth.	YES	NO
10.	Kilograms would tell you how tall you are.	YES	NO
11.	Maps can help you find the way to where you want to go.	YES	NO
12.	Even if you don't need an exact number, you still have to count.	YES	NO
13.	Kids should learn to read clocks so they can get places on their own.	YES	NO
14.	A graph can help you to tell time.	YES	NO

S/C/
(side 2)

STUDENT MATH CONTENT FORM (PRETEST/POSTTEST)

NAME______________________ DATE________________

FILL IN THE BLANK

1. A basketball weighs about________ kilograms.

2. There are about ______ pounds in a kilogram.

3. A pencil weighs about _________ grams.

4. 23 rounded off to the nearest ten is _______.

5. 68 rounded off to the nearest ten is _______.

6. 385 rounded off to the nearest hundred is ______.

TEACHER SEMANTIC DIFFERENTIAL (PRETEST/POSTTEST)

PAGE 1

NAME____________________________________

Directions: Please rate the word at the top of each page, using the pairs of adjectives written below. Please note the scale values*at the bottom of the page.

EDUCATIONAL TELEVISION

	(1)*	(2)	(3)	(4)	(5)	(6)	(7)	
EXCITING	:____	:____	:____	:____	:____	:____	:____:	DULL
INTERESTING	:____	:____	:____	:____	:____	:____	:____:	BORING
DON'T LIKE	:____	:____	:____	:____	:____	:____	:____:	LIKE
EASY	:____	:____	:____	:____	:____	:____	:____:	HARD
UNFAIR	:____	:____	:____	:____	:____	:____	:____:	FAIR
GOOD	:____	:____	:____	:____	:____	:____	:____:	BAD
RELAXING	:____	:____	:____	:____	:____	:____	:____:	TIRING
FAST	:____	:____	:____	:____	:____	:____	:____:	SLOW
OLD	:____	:____	:____	:____	:____	:____	:____:	NEW
USEFUL	:____	:____	:____	:____	:____	:____	:____:	WORTHLESS
ALIVE	:____	:____	:____	:____	:____	:____	:____:	LIFELESS
UNNECESSARY	:____	:____	:____	:____	:____	:____	:____:	NECESSARY
UNIMPORTANT	:____	:____	:____	:____	:____	:____	:____:	IMPORTANT
SUCCESSFUL	:____	:____	:____	:____	:____	:____	:____:	UNSUCCESSFUL
DISORGANIZED	:____	:____	:____	:____	:____	:____	:____:	ORGANIZED
EFFECTIVE	:____	:____	:____	:____	:____	:____	:____:	INEFFECTIVE
HARMFUL	:____	:____	:____	:____	:____	:____	:____:	HELPFUL
FLEXIBLE	:____	:____	:____	:____	:____	:____	:____:	INFLEXIBLE
INFORMATIVE	:____	:____	:____	:____	:____	:____	:____:	UNINFORMATIVE
DISCOURAGING	:____	:____	:____	:____	:____	:____	:____:	REWARDING

*(1) = Extremely Exciting
(2) = Quite Exciting
(3) = Slightly Exciting
(4) = Neither Exciting Nor Dull
(5) = Slightly Dull
(6) = Quite Dull
(7) = Extremely Dull ... (Etc.)

Directions: Please rate the word at the top of each page, using the pairs of adjectives written below. Please note the scale values*at the bottom of the page.

MATH

	(I)*	(2)	(3)	(4)	(5)	(6)	(7)	
EXCITING								DULL
INTERESTING								BORING
DON'T LIKE								LIKE
EASY								HARD
UNFAIR								FAIR
GOOD								BAD
RELAXING								TIRING
FAST								SLOW
OLD								NEW
USEFUL								WORTHLESS
ALIVE								LIFELESS
UNNECESSARY								NECESSARY
UNIMPORTANT								IMPORTANT
SUCCESSFUL								UNSUCCESSFUL
DISORGANIZED								ORGANIZED
EFFECTIVE								INEFFECTIVE
HARMFUL								HELPFUL
FLEXIBLE								INFLEXIBLE
INFORMATIVE								UNINFORMATIVE
DISCOURAGING								REWARDING

*(1) = Extremely Exciting
(2) = Quite Exciting
(3) = Slightly Exciting
(4) = Neither Exciting Nor Dull
(5) = Slightly Dull
(6) = Quite Dull
(7) = Extremely Dull ... (Etc.)

Directions: Please rate the word at the top of each page, using the pairs of adjectives written below. Please note the scale values*at the bottom of the page.

TELEVISION PROGRAMS ON MATH

	(1)*	(2)	(3)	(4)	(5)	(6)	(7)	
EXCITING								DULL
INTERESTING								BORING
DON'T LIKE								LIKE
EASY								HARD
UNFAIR								FAIR
GOOD								BAD
RELAXING								TIRING
FAST								SLOW
OLD								NEW
USEFUL								WORTHLESS
ALIVE								LIFELESS
UNNECESSARY								NECESSARY
UNIMPORTANT								IMPORTANT
SUCCESSFUL								UNSUCCESSFUL
DISORGANIZED								ORGANIZED
EFFECTIVE								INEFFECTIVE
HARMFUL								HELPFUL
FLEXIBLE								INFLEXIBLE
INFORMATIVE								UNINFORMATIVE
DISCOURAGING								REWARDING

*(1) = Extremely Exciting
(2) = Quite Exciting
(3) = Slightly Exciting
(4) = Neither Exciting Nor Dull
(5) = Slightly Dull
(6) = Quite Dull
(7) = Extremely Dull ... (Etc.)

TEACHER OPINION FORM (POSTTEST ONLY)

COMMENTS ON THE INFINITY FACTORY SERIES

(In formulating your comments, please consider the range of both mathematical and cultural/affective objectives of the INFINITY FACTORY series, as outlined in the Program Guides. Use the back of this sheet or additional sheets if necessary.)

I. What is your overall impression of the INFINITY FACTORY series?

II. Which particular parts of the programs seem most effective in meeting the needs of students and the objectives of the series? Why?

III. Which particular parts of the programs seem least effective in meeting the needs of students and the objectives of the series? Why?

IV. In what specific ways can the INFINITY FACTORY television programs and Program Guides be improved? What do we need more of? What do we need less of?

APPENDIX C

Weekly Instruments

Student Weekly Response Forms, Shows A to H

Student Attention Forms, Shows A to H

Teacher Weekly Questionnaire

S/Wk/Gen

STUDENT WEEKLY RESPONSE FORM: SHOW A

NAME ______________________ DATE ______________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

SHOW A   Side 2

NAME________________________________

CIRCLE YES OR NO

1. This program was about graphs.	YES	NO
2. People can sometimes tell time without a watch or a clock.	YES	NO
3. The big hand on a clock is called the minute hand.	YES	NO
4. The kid at Scoops' Place store who couldn't tell time was stupid.	YES	NO
5. I would have trouble learning to read a clock.	YES	NO
6. The name of this program is Electric Factory.	YES	NO
7. I would like to learn different ways to tell time without using a clock.	YES	NO
8. Different kinds of women can be very good at sports.	YES	NO
9. You can count off seconds by saying "A thousand and one, a thousand and two, ..."	YES	NO
10. Kids should learn to read clocks so they can get places on their own.	YES	NO

S/Wk/Gen

STUDENT WEEKLY RESPONSE FORM: SHOW B

NAME ______________________ DATE ______________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

SHOW B Side 2

NAME ______________________________

CIRCLE YES OR NO

1.	The name of this Program is Infinity Factory.	YES	NO
2.	This program was about rounding off.	YES	NO
3.	The kids who live in the Brownstone house are singing about life in the city.	YES	NO
4.	48 rounded off to the nearest ten is 50.	YES	NO
5.	The taxi cab driver used rounding off to get where he was going.	YES	NO
6.	The program showed ways that people could help their friends.	YES	NO
7.	In the part where the kids started a business, Apple cheated his friends out of some money.	YES	NO
8.	The newspaper boy wanted extra money to buy a bike.	YES	NO
9.	Scoops, the man who owns the neighborhood store, used rounding off to add numbers in his head.	YES	NO
10.	Rounding off is easy.	YES	NO

FILL IN THE BLANK

11. 42 rounded off to the nearest ten is ________.

12. 57 rounded off to the nearest ten is ________.

STUDENT WEEKLY RESPONSE FORM: SHOW C

NAME ______________________ DATE ______________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

SHOW C Side 2

NAME ______________________________

CIRCLE YES OR NO

1. The people at the zoo were asked to guess how much the animals weighed.	YES	NO
2. This program showed different ways to measure weight.	YES	NO
3. The boy lifting the weights was playing a trick on his older friends.	YES	NO
4. The two boys who were supposed to box with each other got scared.	YES	NO
5. The man who sold vegetables weighed them in meters.	YES	NO
6. There are one hundred grams in a kilogram.	YES	NO
7. A washing machine weighs about 1 kilogram.	YES	NO
8. A bunch of pictures were shown at the Brownstone house about a man who built large scales.	YES	NO
9. At the end of the program the kids in the Brownstone house were holding scales.	YES	NO
10. I would like to be friends with the kids on the program who live in the Brownstone house.	YES	NO

FILL IN THE BLANK

11. A shoe weighs about _______ kilograms,

12. There are about ______ pounds in a kilogram.

S/Wk/Gen

STUDENT WEEKLY RESPONSE FORM: SHOW D

NAME ____________________ DATE ____________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

NAME ______________________________

SHOW D Side 2

CIRCLE YES OR NO

1.	Maps can help you find the way to where you want to go.	YES	NO
2.	The kids in the nightclub who were dancing would stop to add and subtract numbers.	YES	NO
3.	In one part of the show, the kids painted a map on a wall.	YES	NO
4.	A bunch of pictures were shown at the Brownstone house about men who make maps.	YES	NO
5.	You can use scaling to find out what color to paint something.	YES	NO
6.	At Scoops' Place, the lady named Sister Stokes drew a map so all the kids in the parade would leave home at the same time.	YES	NO
7.	I think I could follow the map like the one the kids were using for the parade.	YES	NO
8.	This program was about graphs.	YES	NO
9.	I would like to be friends with the kids who live in City Flats, where the bakery is.	YES	NO
10.	I would like to learn different ways to use maps.	YES	NO

STUDENT WEEKLY RESPONSE FORM: SHOW E

NAME ______________________

DATE ______________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

SHOW E Side 2

NAME________________________

CIRCLE YES OR NO

1.	The girl singing in the nightclub was singing about graphs.	YES	NO
2.	Boys always run faster than girls.	YES	NO
3.	You can use graphs to keep track of how often you go to the store.	YES	NO
4.	Making graphs is too hard for me.	YES	NO
5.	If you make a graph you can run faster.	YES	NO
6.	The kids on the program who live in the Brownstone house used graphs to keep track of how many people live in their building.	YES	NO
7.	I could learn how to read a graph.	YES	NO
8.	I don't like Apple, the kid who works in the bakery, because he is always making mistakes.	YES	NO
9.	I would like to learn different ways to use graphs.	YES	NO
10.	I would like to be friends with the kids from Scoops' Place, the neighborhood store.	YES	NO

S/Wk/Gen

STUDENT WEEKLY RESPONSE FORM: SHOW F

NAME ______________________________ DATE ______________________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

SHOW F Side 2

NAME_______________________

CIRCLE YES OR NO

1.	This program was about estimation.	YES	NO
2.	In the bakery, Apple estimated how many chocolate candies there were by counting every one.	YES	NO
3.	You can use estimation when it doesn't matter exactly how much you have.	YES	NO
4.	The people on the street were asked to estimate how many people there were in the world.	YES	NO
5.	You can estimate how many chairs will fit into a room.	YES	NO
6.	A girl in the cartoon counted how many eggs she had.	YES	NO
7.	The kids in the Brownstone house showed pictures of a famous Mexican.	YES	NO
8.	The kids who took movies of a festival estimated how much film to buy.	YES	NO
9.	I would like to be friends with the kids on the program who live in the Brownstone house.	YES	NO
10.	The part where the kids in the Brownstone house show pictures is boring.	YES	NO

S/Wk/Gen

STUDENT WEEKLY RESPONSE FORM: SHOW G

NAME ______________________ DATE ______________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

SHOW G Side 2

NAME: ____________________

CIRCLE YES OR NO

1.	This program showed different ways to measure length.	YES	NO
2.	It is not important to learn about grams and kilograms.	YES	NO
3.	Kilograms would tell you how tall you are.	YES	NO
4.	Miss Marie was going to Florida.	YES	NO
5.	A dollar weighs about a gram.	YES	NO
6.	I would like to be friends with the kids who live in City Flats where the bakery is.	YES	NO
7.	Loli and Apple (the boy and the girl in the bakery) are always fighting.	YES	NO
8.	In the bakery, the scale which came in the mail worked right.	YES	NO
9.	It is easy to hear what the Brownstone kids are saying.	YES	NO
10.	Kids weigh more than a 100 grams.	YES	NO
11.	There are about __________ pounds in a kilogram.		
12.	There are _________ grams in a kilogram.		

S/Wk/Gen

STUDENT WEEKLY RESPONSE FORM: SHOW H

NAME ____________________

DATE ____________________

	HARD (1)	EASY (2)	GOOD (3)	NO GOOD (4)	FUN (5)	NO FUN (6)	TOO LONG (7)	TOO SHORT (8)	TOO FAST (9)	TOO SLOW (10)
(A) I think the show was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(B) I think the part about the kids in the brownstone house was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(C) I think the part about City Flats was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(D) I think the part about Scoops' Place was:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(E) I think the cartoons were:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

NAME______________________

CIRCLE YES OR NO

1.	This program was about weight.	YES	NO
2.	The phone kept waking up the kid to tell him the time.	YES	NO
3.	When Cindy and Apple were riding their bikes, Cindy got mad at Apple because she thought they were lost.	YES	NO
4.	If I got lost I would ask for help.	YES	NO
5.	You can find how far you have to go by using the scale on a map.	YES	NO
6.	You can use scaling when you are planning to build something.	YES	NO
7.	I think scaling would be hard to learn.	YES	NO
8.	Blind people read special maps with their fingers.	YES	NO
9.	Blind kids can't go anywhere alone.	YES	NO
10.	I would like to be friends with the kids from Scoop's Place.	YES	NO

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STUDENT ATTENTION FORM: SHOW A

Show #A - TIME________ Date:________ Class:____________ School:______________ Observer:____________________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-second segment.
Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music	☒	☒	5:00	and you			10:00	the big hand		
:15	Music			5:15	beautiful child			10:15	call this now		
:30	Music			5:30	cutie, don't			10:30	two o'clock		
:45	Music			5:45	somebody			10:45	another hand		
1:00	people doin?			6:00	12:00			11:00	once each hour		
1:15	done a song			6:15	what time is it			11:15	half way around		
1:30	my stomach			6:30	and where			11:30	just goes to show		
1:45	(silence) mostly			6:45	ever, never			11:45	(oven door opening)		
2:00	saw a clock			7:00	thought you			12:00	at the tone		
2:15	I can't function			7:15	how do you know			12:15	at the tone		
2:30	wonder what			7:30	bye			12:30	Music		
2:45	Music			7:45	goes downstairs			12:45	from tennessee		
3:00	beat goes on			8:00	boy watch			13:00	Man or woman		
3:15	(telephone rings)			8:15	Kung Fu class			13:15	of a second		
3:30	2:40			8:30	You just be late			13:30	24 seconds flat		
3:45	(silence) music			8:45	radio programs			13:45	Hey!		
4:00	Music			9:00	at the same time			14:00	party then		
4:15	Music			9:15	again and again			14:15	she taking		
4:30	Young sounding			9:30	and no more			14:30	50 minutes		
4:45	and swinging			9:45	don't be playing			14:45	Music		

Show # A - TIME
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	sure you don't			20:00	finish it			25:00	(silence) maybe		
15:15	good-bye			20:15	hey, get your			25:15	now and ever		
15:30	Music			20:30	to say that			25:30	bit of time		
15:45	(phone picked up)			20:45	here help me			25:45	a minute's up		
16:00	hey, did you			21:00	(silence)			26:00	to eleven		
16:15	Music			21:15	Apple			26:15	Music		
16:30	Music			21:30	(yawn)			26:30	(rumbling noises)		
16:45	only on table			21:45	from 20 min.			26:45	that's it		
17:00	well, for the			22:00	Tito			27:00	first you		
17:15	do birds fly?			22:15	Music			27:15	Music		
17:30	(silence)			22:30	can have the			27:30	Music		
17:45	sales over			22:45	(door oven squeaking)			27:45	Music		
18:00	Music			23:00	(silence)			28:00	(Kids talking)		
18:15	Music			23:15	(singing & harmonica)			28:15	Music		
18:30	Music			23:30	(clapping)			28:30	Music		
18:45	everybody gets			23:45	(talking)			28:45			
19:00	be quiet			24:00	Music			29:00			
19:15	(silence)			24:15	Music			29:15			
19:30	soon, um			24:30	a thousand and			29:30			
19:45	eyes, this is			24:45	I know the			29:45			

STUDENT ATTENTION FORM: SHOW B

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Show # B -APPROXIMATION Date: ________ Class: ________________ School: ____________________ Observer: ______________________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-second **segment.**
Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music			5:00	iceberg			10:00	to my Dad		
:15	Music			5:15	three fity-five			10:15	your percentage		
:30	Music			5:30	sure, man			10:30	comin' up		
:45	Music (stops)			5:45	sirs			10:45	Music		
1:00	Music			6:00	almost in business			11:00	(horns honking)		
1:15	this number			6:15	what I'm thinking			11:15	in a hurry		
1:30	another number			6:30	namely, the			11:30	Music		
1:45	hey, Zack			6:45	in front of the			11:45	hold 36,000		
2:00	Now take another			7:00	7 bucks apiece			12:00	Music		
2:15	to its closest			7:15	won't regret this			12:15	look so great		
2:30	Music			7:30	what was true?			12:30	catalogue says		
2:45	Music			7:45	industry			12:45	twenty-nine		
3:00	I bet you			8:00	(silence)			13:00	ten bucks		
3:15	(silence)			8:15	where's Apple?			13:15	I've got to		
3:30	(silence) that			8:30	explaining to do			13:30	always wring		
3:45	you own it			8:45	know anything			13:45	Music		
4:00	Music			9:00	off everything			14:00	Music		
4:15	Music			9:15	3 bucks			14:15	$90.00		
4:30	good, I'll			9:30	the syrup			14:30	Music		
4:45	I'll be your			9:45	so that's			14:45	82 customers		

Show # B - APPROXIMATION
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	profit in month			20:00	One to 100			25:00	it's amazing		
15:15	and the bike			20:15	just a little less			25:15	800		
15:30	ask some other			20:30	Music			25:30	well, it's simple		
15:45	48 is			20:45	that's the score			25:45	500 than		
16:00	Music			21:00	hey, he,			26:00	add them up		
16:15	Music			21:15	(mumbling)			26:15	that's really		
16:30	Music			21:30	Music			26:30	me Scoops		
16:45	Music			21:45	remember we			26:45	any number		
17:00	I'm keep trying			22:00	excuse			27:00	2,300		
17:15	Music			22:15	add up 270			27:15	ah, come on		
17:30	Music			22:30	let me check it			27:30	this isn't the		
17:45	yeah, they			22:45	exact same thing			27:45	Music		
18:00	put it on			23:00	approximation			28:00	43 let's say		
18:15	start the Mexican			23:15	574			28:15	40's far away		
18:30	The people			23:30	792			28:30	Music		
18:45	everytime they			23:45	I just did			28:45			
19:00	dangerous when			24:00	Scoop's is a			29:00			
19:15	aha!			24:15	find Scoops'			29:15			
19:30	where I'm goin			24:30	hey, Felicia			29:30			
19:45	Music			24:45	blow your mind			29:45			

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STUDENT ATTENTION FORM : SHOW C

Show # C - WEIGHT Date:________ Class:________ School:________ Observer:________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-second segment.
Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music			5:00	boy Saturday			10:00	Music		
:15	Music			5:15	no, wait a minute			10:15	Music		
:30	Music			5:30	Caldwell			10:30	Music		
:45	Music (stops)			5:45	(silence)			10:45	hurry up		
1:00	ah, air			6:00	do it like			11:00	Music		
1:15	heavy weight			6:15	Man, I			11:15	Music & (cheering)		
1:30	(street noises)			6:30	tell her what			11:30	Music		
1:45	I'd say			6:45	(silence)			11:45	greatest fighters		
2:00	2 tons			7:00	last few days			12:00	(loud cheering)		
2:15	(child mumbling)			7:15	(silence)			12:15	(loud cheering)		
2:30	I'm going to			7:30	let me see			12:30	whatcha been		
2:45	the other one			7:45	(heavy breathing)			12:45	in the metric		
3:00	trunks on the			8:00	(clapping)			13:00	one pound		
3:15	let's go			8:15	(laughing)			13:15	at night		
3:30	Seventh and Sixth Avenue			8:30	man, I gonna			13:30	he works as		
3:45	get that			8:45	Scoop's weights			13:45	they are shipped		
4:00	Music			9:00	ah, man I			14:00	(truck motors)		
4:15	hey, yaw!			9:15	(laughter)			14:15	grows in the		
4:30	(Kids yelling)			9:30	(cheering)			14:30	somebody		
4:45	comradie			9:45	Music			14:45	make sure		

Show # C - WEIGHT
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	eleven fifty			20:00	(sight)			25:00	it's some sort of		
15:15	400 lbs.			20:15	you don't even			25:15	kilo's a 1,000		
15:30	every night			20:30	they should each			25:30	which is		
15:45	you eat a saldad			20:45	come on partner			25:45	Music		
16:00	almost there			21:00	having problems			26:00	thousands of them		
16:15	Music			21:15	Miss Know-it-all			26:15	(silence)		
16:30	ah, now for			21:30	make pounds to			26:30	me count		
16:45	you go walking			21:45	3 lbs. for			26:45	Music		
17:00	aha!			22:00	those ojas			27:00	Music		
17:15	grams			22:15	O.K.			27:15	Music		
17:30	to both of you			22:30	(silence) hey			27:30	Music		
17:45	80 kilograms			22:45	some people are			27:45	Music		
18:00	in Antartica			23:00	with the tray			28:00	Music		
18:15	1,000 times			23:15	which is 1 lb.			28:15	Music		
18:30	Music			23:30	You Apple			28:30	Music		
18:45	Music			23:45	just one more			28:45			
19:00	Music			24:00	umm, they sure			29:00			
19:15	corn husks			24:15	they're good			29:15			
19:30	we have to pay			24:30	Music			29:30			
19:45	good work, huh			24:45	don't know very			29:45			

STUDENT ATTENTION FORM : SHOW D

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Show
D -Mapping & Scaling   Date:__________   Class:________________   School:____________________   Observer:______________________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-second segment.
Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music			5:00	Tudy and Dad are			10:00	Take a look		
:15	Music			5:15	and Siqueros			10:15	Tito Siqueros		
:30	Music			5:30	en verano			10:30	Oh,		
:45	Music (stops)			5:45	we're gonna			10:45	bravo (clapping)		
1:00	fastes way to get			6:00	let me see that			11:00	Music		
1:15	I got to meet her			6:15	Oooh, no			11:15	it's a		
1:30	stupid scales are			6:30	No, they must have			11:30	Siqueros		
1:45	91st and Jamaica			6:45	We can get			11:45	decorates the walls		
2:00	Music			7:00	to be for all us			12:00	and tell them		
2:15	Music			7:15	Too			12:15	saw one in		
2:30	Music (clapping)			7:30	or Rivera			12:30	Music		
2:45	Music (clapping)			7:45	that we have here			12:45	ocho mas nueve		
3:00	Music (clapping)			8:00	we place the same			13:00	Music		
3:15	Music			8:15	on our sketch			13:15	Tired		
3:30	Music (new theme)			8:30	same number of			13:30	out of proportion		
3:45	Music			8:45	onw square on the			13:45	(silence) yours		
4:00	Music			9:00	you guys get			14:00	but they're not		
4:15	(traffic noises)			9:15	Music			14:15	Music		
4:30	muchas gracias			9:30	Music			14:30	we're here		
4:45	some books, today			9:45	Music			14:45	ah, yes		

Show # D Mapping & Scaling
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	Look around			20:00	Turn left into			25:00	checked the map		
15:15	correspond			20:15	street will meet			25:15	end up by the		
15:30	must be that way			20:30	into the City Hall			25:30	(birds singing)		
15:45	Music (clapping)			20:45	real good			25:45	(birds singing)		
16:00	17, 56			21:00	another little announcement			26:00	whick way Momo		
16:15	Music (clapping)			21:15	(silence)			26:15	(squealing children)		
16:30	Music			21:30	south side of Main			26:30	(squealing children		
16:45	in the big youth			21:45	City Hall steps			26:45	(silence)		
17:00	have the priviledge			22:00	a lot of them			27:00	(swishing)		
17:15	you all know			22:15	of course, of course			27:15	once we checked		
17:30	this year, I			22:30	(silence)			27:30	(silence)		
17:45	To City Hall			22:45	of the banner			27:45	(park noises)		
18:00	up Pacific, across			23:00	march outside			28:00	Music (clapping)		
18:15	(adults shouting			23:15	(marching chant)			28:15	Music (clapping)		
18:30	all here now			23:30	Music			28:30	Music (clapping		
18:45	(silence) very			23:45	17 minus			28:45			
19:00	a part of the			24:00	Music			29:00			
19:15	(silence) now			24:15	Music			29:15			
19:30	attention			24:30	by ourselves			29:30			
19:45	that marks			24:45	go			29:45			

STUDENT ATTENTION FORM : SHOW E

SATT-1/76

Show # E -GRAPHS Date:________ Class:________ School:________ Observer:________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-**second segment.** Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music			5:00	phew			10:00	to tryouts		
:15	Music			5:15	where you puttin			10:15	better track		
:30	Music			5:30	win the championship			10:30	but when they		
:45	Music			5:45	deceive me			10:45	chamionship, your		
1:00	ooh			6:00	hey, I remember			11:00	time, yeah		
1:15	(silence) hey			6:15	a long time ago			11:15	let the best person		
1:30	let's help him			6:30	the trouble is			11:30	your childhood		
1:45	points to the right			6:45	don't			11:45	(silence) three		
2:00	back it up one			7:00	only when she			12:00	what happened to		
2:15	I dunno			7:15	runner			12:15	what's that?		
2:30	Music			7:30	(silence)			12:30	my mother gave me		
2:45	it was an autograph			7:45	it's like I ran			12:45	recess I traded		
3:00	um, um, um			8:00	wrote down the times			13:00	way home I bought		
3:15	um, um, um			8:15	Sugar Pie's performance			13:15	finally, my mother		
3:30	um, um, um (fades out)			8:30	going to 12 sec.			13:30	Music		
3:45	what I mean			8:45	11.5 seconds			13:45	if we just stick		
4:00	her first precious			9:00	this line above			14:00	I don't know why		
4:15	good news			9:15	well, think of me			14:15	that could be right		
4:30	Music			9:30	then almost levels			14:30	I use the bar		
4:45	Music			9:45	and me			14:45	and the electricity		

Show # E-GRAPHS
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	to the landlord			20:00	I'm making it			25:00	but they were all		
15:15	by a stream			20:15	over here at			25:15	right, oh		
15:30	yonder			20:30	keeping track			25:30	on the graph		
15:45	is 42			20:45	on Monday we			25:45	mehito		
16:00	hey, Michael			21:00	(silence) like			26:00	Music		
16:15	on the phone			21:15	(bells ringing)			26:15	Music		
16:30	gonna keep on			21:30	(sigh)			26:30	litle darlin		
16:45	(humming)			21:45	hey, I can't			26:45	Music (soft)		
17:00	(crashing)			22:00	on Thursdays			27:00	graph		
17:15	Muisc (soft)			22:15	what about this			27:15	Music		
17:30	a lot of time			22:30	in the back			27:30	Music		
17:45	math teacher			22:45	(silence) I'm			27:45	Music		
18:00	yeah, yeah			23:00	Thursdays, sure			28:00	Music		
18:15	Music			23:15	I mean it			28:15	Music		
18:30	Music			23:30	Make a mess of			28:30	Music		
18:45	(silence)			23:45	(silence) Mama			28:45			
19:00	esta bien			24:00	(cash register rings)			29:00			
19:15	(silence)			24:15	getting ripped off			29:15			
19:30	quentas?			24:30	every Thursday			29:30			
19:45	bye, bye now			24:45	not because a			29:45			

SATT-1/76

STUDENT ATTENTION FORM: SHOW F

Show # F- ESTIMATION Date:________ Class:____________ School:________________ Observer:____________________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-second segment. Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music			5:00	Now tell me			10:00	100		
:15	Music			5:15	Buenas tardes			10:15	I can't see		
:30	Music			5:30	counted everything			10:30	tried it once		
:45	Music			5:45	four across			10:45	Music		
1:00	Take a look at this			6:00	Oh, wow			11:00	Music		
1:15	999,000			6:15	We don't have			11:15	Nine times		
1:30	Oh, fat chance			6:30	As possible			11:30	Music		
1:45	Our chart says			6:45	That's about			11:45	Music		
2:00	Those fleas could			7:00	Nopales			12:00	Music		
2:15	About 3,000			7:15	The whole thing			12:15	I think we can		
2:30	Couple a million			7:30	There!			12:30	I hope it was good		
2:45	So....			7:45	estimated 300			12:45	Oh, give me		
3:00	Music			8:00	little brother			13:00	I have got		
3:15	Music			8:15	Kids, in the world			13:15	Then what's up		
3:30	Music			8:30	on the first page			13:30	Every inch of it		
3:45	Music			8:45	(telephone ring)			13:45	So I went		
4:00	Music			9:00	late night movie			14:00	That's wonderful		
4:15	Music (City Flats)			9:15	couldn't you estimate			14:15	besides -		
4:30	Music			9:30	sandals diaper			14:30	That's a big group		
4:45	Music			9:45	6, 7,			14:45	I don't know		

Show #F - ESTIMATION
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	Well			20:00	of New York			25:00	Music		
15:15	for a church meeting			20:15	sh, sh			25:15	Music		
15:30	(silence) three			20:30	Puerto Rican soul			25:30	Music		
15:45	two			20:45	hey,			25:45	(Parade noises)		
16:00	foru chairs across			21:00	Music			26:00	Music		
16:15	you should have			21:15	Music			26:15	Music		
16:30	and we'd be			21:30	Pop			26:30	Music		
16:45	(silence)			21:45	What's this			26:45	Music		
17:00	(laughter)			22:00	You estimate			27:00	Music		
17:15	(clapping & music)			22:15	of the cost			27:15	you chicken		
17:30	righteous consideration			22:30	film			27:30	Music		
17:45	50 chickens			22:45	50 min. of film			27:45	Music		
18:00	I'm not counting			23:00	roll of film			28:00	Music		
18:15	chickens can't			23:15	Music			28:15	Music		
18:30	Music			23:30	Luisa			28:30	Music		
18:45	$63 \div 7$ (in Spanish)			23:45	this procession			28:45			
19:00	Music			24:00	Oh, yeah!			29:00			
19:15	Music			24:15	Music			29:15			
19:30	Music			24:30	Music			29:30			
19:45	Music			24:45	Music			29:45			

STUDENT ATTENTION FORM : SHOW G

SATT-1/76

Show # G-EIGHT Date:_________ Class:_______________ School:_________________ Observer:_________________
week 7

Record the number of children paying attention to (ATT) and responding to (RES) each 15-**second segment.**
Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music	☒	☒	5:00	36 and past your prime			10:00	Let's check it out		
:15	Music			5:15	Go out and get what's mine			10:15	Hmm! kilograms		
:30	Music			5:30	Now when I stand on scale			10:30	Now what about that		
:45	Music			5:45	I shall sit			10:45	I don't either		
1:00	Hey Come on with us			6:00	(Music)			11:00	Replace the old pound system		
1:15	or a feather weight			6:15	(Music)			11:15	Eighty pounds		
1:30	Cause sometimes I'm a			6:30	I can hardly wait			11:30	60 pounds underweight		
1:45	Being what I am			6:45	I still can't believe it			11:45	2 pounds make a kilogram		
2:00	A thousand pounds			7:00	Let me see it			12:00	Take care, honey		
2:15	Ton and a half			7:15	Listen more often			12:15	I got a gram		
2:30	About 5 tons			7:30	The dead are not gone			12:30	I'm not talking about		
2:45	I could carry			7:45	in the murmuring wood			12:45	Ohh!		
3:00	Yes, Let me try it on			8:00	in the wind hear			13:00	Hurry, hurry		
3:15	Senor:			8:15	Oh, my			13:15	Now if I'm off		
3:30	We have to weigh			8:30	Well, I made myself a promise			13:30	45 kilograms		
3:45	Wait a minute young lady			8:45	Old enough not to need me			13:45	Let's have a hand		
4:00	(Third sound effects)			9:00	he'll meet us			14:00	52 kilograms		
4:15	Some elephant joke			9:15	There's not much here			14:15	Calm down		
4:30	Ladies and gents			9:30	overnight with our luggage			14:30	47 kilograms		
4:45	I've got the 4 X 9			9:45	on the bathroom scale			14:45	I rely solely		

Show # G-WEIGHT
Page. 2 week 7

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	I've got the 9 X 4			20:00	Music (City Flats)			25:00	No, No that's exactly		
15:15	On an ocean cruise			20:15	Music			25:15	So what's wrong with that?		
15:30	Hey, Nancy			20:30	Music			25:30	A kilogram is		
15:45	You got a candy gram			20:45	And so you see			25:45	about 2 1/2 kilograms		
16:00	Look see for yourself			21:00	Loli, Dad's an artist			26:00	that's what the masa was for		
16:15	A kilogram is equal to			21:15	Only I beat you to it			26:15	see my lawyer		
16:30	How much does your house weigh			21:30	It's probably that scale			26:30	because today		
16:45	Oh, my gosh			21:45	(bell on door)			26:45	Oh I should have done this		
17:00	Quite a few tons			22:00	Hey what's happening			27:00	free to be free		
17:15	Maybe 10 tons			22:15	She is?			27:15	Or a feather's weight		
17:30	About Dr. Ramon E. Betances			22:30	My Abuelita makes			27:30	paper weight		
17:45	He was also a doctor			22:45	I came by to get			27:45	being what I am		
18:00	the father of Independence			23:00	weigh the masa.			28:00	like light weight		
18:15	They would grow up to be			23:15	For Senora Perez this morning			28:15	being what I am		
18:30	All possible choices			23:30	It does weigh			28:30	(Music)		
18:45	Out of sight brother			23:45	Let's weigh something else			28:45			
19:00	To balance myself on one leg			24:00	but the scale says			29:00			
19:15	behold a melody			24:15	It weighs 5 pounds			29:15			
19:30	see what tomorrow holds			24:30	The scale says 2 1/2 pounds			29:30			
19:45	and charge my spark			24:45	perfectly frosted cake			29:45			

SATT-1/76

STUDENT ATTENTION FORM: SHOW H

Show # H MAPPING & SCALING Date:_________ Class:_______________ School:_________________ Observer:___________________

Record the number of children paying attention to (ATT) and responding to (RES) each 15-second segment. Alternate between two groups of five children at each 15-second interval.

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
:00	Music			5:00	Well, maybe			10:00	You hit Gage		
:15	Music			5:15	never			10:15	On your bikes		
:30	Music			5:30	Sir? hey			10:30	Music		
:45	Music			5:45	(silence), busy			10:45	tracer of lost		
1:00	You mean			6:00	hey, man			11:00	of water		
1:15	(voices)			6:15	tell us			11:15	do		
1:30	Music			6:30	a map			11:30	(silence) the		
1:45	(telephone ring)			6:45	Gage			11:45	One inch		
2:00	(phone hung up)			7:00	(muttering)			12:00	I only have		
2:15	Music			7:15	Music			12:15	and you'll find		
2:30	Music			7:30	Music			12:30	no Joe here		
2:45	Oh, sorry			7:45	Music			12:45	Music (fades out)		
3:00	700 miles			8:00	Music			13:00	(silence)		
3:15	real beautiful			8:15	Music			13:15	W.E.B. Du Bois		
3:30	to 500 miles			8:30	she did it			13:30	Yeah?		
3:45	Music			8:45	(silence)			13:45	I'll be right back		
4:00	a lot of money			9:00	Oh, thank you			14:00	Oh, sausage		
4:15	(door closes)			9:15	to First and Gage			14:15	hey, it's getting		
4:30	Music			9:30	Oh, I see			14:30	I can't bring		
4:45	Music			9:45	(silence)			14:45	a hey!		

Show # H,- MAPPING & SCALING
Page. 2

Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES	Time	Audio Cue	ATT	RES
15:00	I hope			20:00	Yeah, but we			25:00	is that		
15:15	but first we			20:15	up in general			25:15	and he just		
15:30	well, if I			20:30	6 inches represents			25:30	encouraged to do		
15:45	let's figure out			20:45	how about a			25:45	much, much better		
16:00	we got to know			21:00	7 inches			26:00	other than that		
16:15	here sausage			21:15	Music			26:15	(silence)		
16:30	it should be			21:30	30 times bigger			26:30	(silence) you		
16:45	(silence) should			21:45	it doesn't			26:45	yeah		
17:00	how do you			22:00	way			27:00	(silence)		
17:15	now architect			22:15	O.K. fix that			27:15	beautiful		
17:30	not a scale of			22:30	Music			27:30	Music		
17:45	4 inches			22:45	there's no Joe			27:45	to go and come		
18:00	6			23:00	Music			28:00	Music		
18:15	do the width			23:15	Music			28:15	Music		
18:30	(silence)			23:30	(silence) put			28:30	Music		
18:45	he wants to be			23:45	let's get on			28:45			
19:00	mathematician			24:00	you're inside			29:00			
19:15	to scale			24:15	we're gonna			29:15			
19:30	aah see			24:30	and we're			29:30			
19:45	out with an idea			24:45	there's			29:45			

INFINITY FACTORY

TEACHER QUESTIONNAIRE (weekly)

Name____________________________Date________________Show #_________________

Class___________________________School________________City__________________

Directions: Please check the items if you agreed with the statement. These statements refer to this week's program only, not the series as a whole.

_________ 1. I like the program.

_________ 2. The program was interesting for my students.

_________ 3. I have previously taught the math content in this program to my class.

_________ 4. I prepared students for the program.

_________ 5. The program was **easy** for my students to understand.

_________ 6. The pace of the program allowed students to absorb the material.

_________ 7. The math topic was appropriate for my class.

_________ 8. The amount of information covered was appropriate for my class.

_________ 9. The program content was appropriate for my grade level.

_________ 10. The program content was appropriate for the math curriculum.

_________ 11. This presentation met the needs of my students.

_________ 12. The order of the program was logical.

_________ 13. The presentation held my students' attention.

_________ 14. The vocabulary was at a level that my class could understand.

_________ 15. The language was appropriate within the context of the program.

_________ 16. The program would stimulate math activities with my students.

_________ 17. The program encourages positive attitudes towards math.

_________ 18. This program presents ethnic groups in a positive manner.

_________ 19. This program presents sex roles in a positive manner.

_________ 20. This program presents social issues appropriate for my class.

_________ 21. This program presents conflict situations my class can understand.

_________ 22. This program presents positive techniques for resolving conflict.

_________ 23. This program is humorous at times.

_________ 24. The students were difficult to control during the program.

_________ 25. The teacher's guide has an adequate amount of information.

_________ 26. The format of the teacher's guide makes the information clear.

_________ 27. The suggestions for activities in the teacher's guide are good.

_________ 28. I would use this guide continuously when using this program.

_________ 29. The picture reception was adequate.

_________ 30. The sound was adequate.

_________ 31. The music was effective.

_________ 32. This program has artistic quality

______33. I would like to have more programs like this.

______34. The program is helpful in presenting math activities to students.

______35. The program makes it easier to discuss math with my students.

______36. I would use more programs like this if they were available.

______37. This program was educationally effective.

______38. The overall presentation in this week's program was:

outstanding______ mediocre _______
good ______ poor ______

_____ 38. Check which areas you think need improvement in this week's program.

______ characters
______ language
______ voices
______ dramatization
______ more visuals
______ more action
______ format variety
______ content math
______ affective content
_____ lower vocabulary
_____ level
_____ music
_____ teacher's guide

Comments on specific aspects of the program and/or changes to be made:

Last Week's Program:
Describe any follow up activities which took place immediately after last week's show or during this past week:

Describe any students' reactions to last week's program noted over the past week:

APPENDIX D

STUDENT COMPREHENSION, MATH CONTENT, AND ATTITUDES: ITEMS SELECTED FOR SUBSCALES

Table D.1

Items on Comprehension Subscale

Show	Item	Positively or Negatively Worded
A	This program was about graphs.	-
	People can sometimes tell time without a watch or a clock.	+
B	The name of this Program is Infinity Factory.	+
	This program was about rounding off.	+
	The kids who live in the Brownstone house are singing about life in the city.	-
	The program showed ways that people could help their friends.	+
	In the part where the kids started a business, Apple cheated his friends out of some money.	-
	The newspaper boy wanted extra money to buy a bike.	+
D	The kids in the nightclub who were dancing would stop to add and subtract numbers.	+
	A bunch of pictures were shown at the Brownstone house about men who make maps.	-
	At Scoops' Place, the lady named Sister Stokes drew a map so all the kids in the parade would leave home at the same time.	-
	This program was about graphs.	-
E	The kids on the program who live in the Brownstone house used graphs to keep track of how many people live in their building.	-
F	This program was about estimation.	+
	The people on the street were asked to estimate how many people there were in the world.	+

Table D.1 (Continued)

Items on Comprehension Subscale

Show	Item	Positively or Negatively Worded
	A girl in the cartoon counted how many eggs she had.	-
	The kids who took movies of a festival estimated how much film to buy.	+
G	This program showed different ways to measure length.	-
	Miss Marie was going to Florida.	-
	In the bakery, the scale which came in the mail worked right.	+
H	This program was about weight.	-
	The phone kept waking up the kid to tell him the time.	-
	When Cindy and Apple were riding their bikes, Cindy got mad at Apple because she thought they were lost.	+
	Blind people read special maps with their fingers.	+

Table D.2

Items on Math Content Subscale

Show	Item	Positively or Negatively Worded
B	Scoops, the man who owns the neighborhood store, used rounding off to add numbers in his head.	+
D	Maps can help you find the way to where you want to go.	+
	You can use scaling to find out what color to paint something.	-
E	If you make a graph, you can run faster.	-
F	In the bakery, Apple estimated how many chocolate candies there were by counting every one.	-
G	Kilograms would tell you how tall you are.	-
	A dollar weighs about a gram.	+
H	You can find how far you have to go by using the scale on a map.	+
B	42 rounded off to the nearest ten is_________.	
	57 rounded off to the nearest ten is _________.	
G	There are about _________pounds in a kilogram.	
	There are __________grams in a kilogram.	

Table D.3

Items on Student Attitude Subscale

Show	Item	Positively or Negatively Worded
A	The kid at Scoops' Place store who couldn't tell time was stupid.	-
	I would have trouble learning to read a clock.	-
B	Rounding off is easy.	+
D	I think I could follow the map like the one the kids were using for the parade.	+
	I would like to be friends with the kids who live in City Flats, where the bakery is.	+
	I would like to learn different ways to use maps.	+
E	Boys always run faster than girls.	-
	Making graphs is too hard for me.	-
	I could learn how to read a graph.	+
	I don't like Apple, the kid who works in the bakery, because he is always making mistakes.	-
F	I would like to be friends with the kids on the program who live in the Brownstone house.	+
G	It is not important to learn about grams and kilograms.	-
	Loli and Apple (the boy and the girl in the bakery) are always fighting.	-
H	If I got lost I would ask for help.	+
	I think scaling would be hard to learn.	-
	Blind kids can't go anywhere alone.	-
	I would like to be friends with the kids from Scoops' Place.	+

APPENDIX E

TEACHER RESPONSES: ITEMS SELECTED FOR SUBSCALES

Table E.1

Teacher Responses: Items Selected for Subscales

CLASS PREPARATION SUBSCALE

I have previously taught the math content in this program to my class.
I prepared students for the program.

PROGRAM GUIDE SUBSCALE

The teacher's guide has an adequate amount of information.
The format of the teacher's guide makes the information clear.
The suggestions for activities in the teacher's guide are good.
I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE

The pace of the program allowed students to absorb the material.
The order of the program was logical.
This program is humorous at times.
The music was effective.
This program has artistic quality.

LANGUAGE SUBSCALE

The vocabulary was at a level that my class could understand.
The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE

The picture reception was adequate.
The sound was adequate.

STUDENT ATTENTION SUBSCALE

The presentation held my students' attention.
The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE

I like the program.
The program was interesting for my students.
I would like to have more programs like this.

Table E.1 (Continued)

The program is helpful in presenting math activities to students.
The program makes it easier to discuss math with my students.
I would use more programs like this if they were available.

MATH CONTENT SUBSCALE

The math topic was appropriate for my class.
The amount of information covered was appropriate for my class.
The program content was appropriate for my grade level.
The program content was appropriate for the math curriculum.
This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE

The program would stimulate math activities with my students.
The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE

This program presents ethnic groups in a positive manner.
This program presents sex roles in a positive manner.
This program presents social issues appropriate for my class.
This program presents conflict situations my class can understand.
This program presents positive techniques for resolving conflict.

APPENDIX F

STUDENT ATTENTION:

FREQUENCY DATA, SHOWS A TO H

Table F.1

Mean Percentage of Student Attention: Frequency Data for Shows A to H

Show	*M*	*SD*	*SE*
A	92%	7.0%	1.5%
B	94%	5.1%	1.1%
C	85%	15.0%	3.3%
D	88%	9.6%	2.1%
E	90%	7.6%	1.6%
F	88%	9.7%	2.1%
G	87%	9.5%	2.1%
H	90%	9.3%	2.0%

Note. *n* = 21 classes for which complete attention data were available.

APPENDIX G

STUDENT APPEAL: COMPARISONS AMONG SHOWS

FREQUENCY DATA AND RESULTS OF STATISTICAL ANALYSES

Table G.1

Weekly Appeal Subscale, Show Overall:

Frequency Data

Show	n	M	SD
A	841	2.83	0.47
B	815	2.80	0.53
C	833	2.65	0.68
D	845	2.71	0.61
E	732	2.60	0.73
F	788	2.71	0.62
G	793	2.53	0.77
H	835	2.58	0.76

Note. Weekly appeal subscale = number of positive adjectives checked for that week. Maximum score = 3.

Table G.2

One-Way Analysis of Variance: Weekly Appeal Subscale, Show Overall

Source of Variation	SS	df	MS	F
Between Shows	63.98	7	9.14	21.10***
Linear Term	44.63	1	44.63	103.08***
Deviation from Linear	19.34	6	3.22	7.44
Within Shows	2803.35	6474	0.43	
Total	2867.34	6481		

***$p < .001$

Table G.3

Weekly Appeal Subscale, Brownstone Segments:

Frequency Data

Show	n	M	SD
A	817	2.75	0.58
B	798	2.70	0.63
C	814	2.66	0.69
D	832	2.66	0.68
E	730	2.54	0.79
F	777	2.63	0.71
G	786	2.45	0.86
H	823	2.48	0.84

Note. Weekly appeal subscale = number of positive adjectives checked for that week. Maximum score = 3.

Table G.4

One-Way Analysis of Variance: Weekly Appeal Subscale, Brownstone Segments

Source of Variation	SS	df	MS	F
Between Shows	62.55	7	8.93	16.68***
Linear Term	52.29	1	52.29	97.61***
Deviation from Linear	10.26	6	1.71	3.19
Within Shows	3412.09	6369	.53	
Total	3474.65	6376		

***$p < .001$

Table G.5

Weekly Appeal Subscale, City Flats:

Frequency Data

Show	*n*	*M*	*SD*
A	827	2.69	0.60
B	809	2.65	0.66
C	827	2.59	0.75
D	832	2.62	0.65
E	725	2.62	0.70
F	784	2.67	0.67
G	781	2.55	0.79
H	821	2.63	0.70

Note. Weekly appeal subscale = number of positive adjectives checked for that week. Maximum score = 3.

Table G.6

One-Way Analysis of Variance: Weekly Appeal Subscale, City Flats

Source of Variation	*SS*	*df*	*MS*	*F*
Between Shows	11.99	7	1.60	3.30**
Linear Term	2.18	1	2.18	4.51*
Deviation from Linear	9.01	6	1.50	3.10
Within Shows	3095.03	6398	0.48	
Total	3106.23	6405		

$^{*}p < .05$

$^{**}p < .01$

Table G.7

Weekly Appeal Subscale, Scoops' Place

Frequency Data

Show	n	M	SD
A	803	2.36	0.93
B	802	2.63	0.70
C	826	2.71	0.63
D	831	2.62	0.72
E	726	2.57	0.75
F	777	2.64	0.70
G	786	2.52	0.82
H	819	2.59	0.74

Note. Weekly appeal subscale = number of positive adjectives checked for that week. Maximum score = 3.

Table G.8

One-Way Analysis of Variance: Weekly Appeal Subscale, Scoops' Place

Source of Variation	SS	df	MS	F
Between Shows	61.20	7	8.74	15.19***
Linear Term	2.92	1	2.92	5.07*
Deviation from Linear	58.28	6	9.71	16.88
Within Shows	3660.13	6362	0.57	
Total	3721.34	6369		

*$p < .05$
***$p < .001$

Table G.9

Weekly Appeal Subscale, Animation Segments:
Frequency Data

Show	n	M	SD
B	779	2.74	0.62
C	815	2.69	0.67
D	826	2.72	0.62
E	728	2.68	0.69
F	780	2.76	0.60
G	773	2.59	0.77
H	825	2.62	0.74

Note. Responses to Show A were dropped from analysis (see text). Weekly appeal subscale = number of positive adjectives checked for that week. Maximum score = 3.

Table G.10

One-Way Analysis of Variance: Weekly Appeal Subscale, Animation Segments

Source of Variation	SS	df	MS	F
Between Shows	17.20	6	2.86	6.23***
Linear Term	6.99	1	6.99	15.20***
Deviation from Linear	10.21	5	2.04	4.44
Within Shows	2538.42	5519	.46	
Total	2555.62	5525		

***$p < .001$

Table G.11

Total Weekly Appeal Subscale:
Frequency Data

Show	*n*	*M*	*SD*
A	758	13.35	2.22
B	711	13.67	2.25
C	744	13.46	2.60
D	764	13.49	2.40
E	655	13.17	2.94
F	717	13.58	2.52
G	698	12.93	3.20
H	755	13.10	2.89

Note. Total weekly subscale = total number of positive adjectives checked for Show, Brownstone, City Flats, Scoops' Place, and animation for a particular show. Maximum score = 15.

Table G.12

One-Way Analysis of Variance: Total Weekly Appeal Subscale

Source of Variation	*SS*	*df*	*MS*	*F*
Between Shows	327.31	7	46.75	6.68^{***}
Linear Term	128.31	1	128.31	18.35^{***}
Deviation from Linear	198.99	6	33.16	4.74
Within Shows	40515.31	5794	6.99	
Total	40842.62	5801		

$^{***}p < .001$

APPENDIX H

STUDENT APPEAL: COMPARISONS AMONG GROUPS

FREQUENCY DATA AND RESULTS OF STATISTICAL ANALYSES

Table H.1

Series Appeal Subscales, Show Overall:

Frequency Data

	Age Group					
	Younger Students			Older Students		
Group	n	M	SD	n	M	SD
Black Students						
Boys	37	21.6	3.4	13	23.1	1.1
Girls	43	22.0	2.4	23	21.7	3.0
Latino Students						
Boys	16	20.7	3.2	20	21.0	4.8
Girls	26	22.3	2.5	19	21.6	3.3
Non-Target Students						
Boys	19	20.9	3.4	21	16.8	4.6
Girls	21	21.8	2.7	24	22.1	2.6

Note. Series appeal subscale = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n_{total} = 283 = all students for whom complete data were available.

Grand Mean = 21.4

SD = 3.4

Table H.2

Analysis of Variance: Series Appeal Subscale, Shows Overall

Source of Variation	SS	df	MS	F
Main Effects	267.51	4	66.87	6.07***
Ethnic Group	104.03	2	52.01	4.72**
Age	12.20	1	12.20	1.10
Sex	126.90	1	126.90	11.52***
Two-Way Interactions	199.48	5	39.89	3.62**
Ethnic Group X Age	44.25	2	22.12	2.00
Ethnic Group X Sex	149.96	2	74.98	6.80***
Age X Sex	1.20	1	1.20	0.10
Explained	466.99	9	51.88	4.71***
Error	3007.40	273	11.01	
Total	3474.40	282	12.32	

Note. Series subscale score = total number of positive adjectives checked for all eight shows. Maximum score = 24.

_n_ = 282 = all students for whom complete data were available.

**$p < .01$

***$p < .001$

Table H.3

Series Appeal Subscale, Brownstone Segments:

Frequency Data

	Age Group					
	Younger Students			Older Students		
Group	n	M	SD	n	M	SD
Black Students						
Boys	32	21.6	3.7	12	22.7	1.6
Girls	39	22.0	3.1	21	21.7	3.1
Latino Students						
Boys	16	20.6	3.3	20	20.0	5.0
Girls	23	22.2	2.7	17	22.4	1.8
Non-Target Students						
Boys	19	19.7	4.9	21	15.7	4.3
Girls	18	21.9	2.6	24	21.1	3.7

Note. Series appeal subscale = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n_{total} = 262 = all students for whom complete data were available.

Grand Mean = 21.0

SD = 3.9

Table H.4

Analysis of Variance: Series Appeal Subscale, Brownstone Segments

Source of Variation	SS	df	MS	F
Main Effects	498.19	4	124.55	9.92***
Ethnic Group	191.55	2	95.77	7.63***
Age	37.33	1	37.33	2.97
Sex	211.20	1	211.20	16.82***
Two-Way Interactions	262.53	5	52.50	4.18***
Ethnic Group X Age	74.35	2	37.17	2.96
Ethnic Group X Sex	155.55	2	77.77	6.19**
Age X Sex	13.12	1	13.12	1.04
Explained	760.73	9	84.52	6.73***
Error	3163.21	252	12.55	
Total	3923.95	261	15.03	

Note. Series subscale score = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n = 262 = all students for whom complete data were available.

**p < .01
***p < .001

Table H.5

Series Appeal Subscale, City Flats:

Frequency Data

Group	Age Group					
	Younger Students			Older Students		
	n	*M*	*SD*	*n*	*M*	*SD*
Black Students						
Boys	35	21.0	3.4	12	23.2	1.5
Girls	37	21.4	2.8	21	21.5	2.7
Latino Students						
Boys	12	20.5	3.7	21	21.2	3.7
Girls	25	21.8	2.7	16	22.1	2.4
Non-Target Students						
Boys	18	21.0	3.8	20	18.0	4.1
Girls	20	21.5	2.5	21	21.0	3.3

Note. Series appeal subscale = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n_{total} = 258 = all students for whom complete data were available.

Grand Mean = 21.2

SD = 3.3

Table H.6

Analysis of Variance: Series Appeal Subscale, City Flats

Source of Variation	SS	df	MS	F
Main Effects	118.80	4	29.70	2.92*
Ethnic Group	69.89	2	34.94	3.43*
Age	1.39	1	1.39	0.13
Sex	40.13	1	40.13	3.94*
Two-Way Interactions	123.99	5	24.79	2.44*
Ethnic Group X Age	82.94	2	41.47	4.08*
Ethnic Group X Sex	44.78	2	22.39	2.20
Age X Sex	0.06	1	0.06	0.00
Explained	242.80	9	26.97	2.65**
Error	2520.33	248	10.16	
Total	2763.13	257	10.75	

Note. Series subscale score = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n = 258 = all students for whom complete data were available.

*$p < .05$

**$p < .01$

Table H.7

Series Appeal Subscale, Scoops' Place:

Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	34	21.3	3.4	13	22.0	2.6
Girls	35	21.3	2.8	22	21.4	2.5
Latino Students						
Boys	15	20.9	3.0	16	20.4	5.7
Girls	20	20.6	3.6	18	22.3	2.4
Non-Target Students						
Boys	18	19.1	4.2	16	18.8	2.4
Girls	17	20.5	2.6	22	20.6	3.7

Note. Series appeal subscale = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n_{total} = 243 = all students for whom complete data were available

Grand Mean = 20.8

SD = 3.4

Table H.8

Analysis of Variance: Series Appeal Subscale, Scoops' Place

Source of Variation	SS	df	MS	F
Main Effects	205.18	4	51.29	4.36 **
Ethnic Group	160.26	2	80.13	6.81 ***
Age	0.94	1	0.94	0.08
Sex	39.02	1	39.02	3.31
Two-Way Interactions	82.78	5	16.55	1.40
Ethnic Group X Age	15.23	2	7.61	0.64
Ethnic Group X Sex	47.48	2	23.74	2.02
Age X Sex	11.66	1	11.66	0.99
Explained	287.96	9	31.99	2.72 **
Error	2797.97	238	11.75	
Total	3085.93	247	12.49	

Note. Series subscale score = total number of positive adjectives checked for all eight shows. Maximum score = 24.

$^{**}p < .01$

$^{***}p < .001$

Table H.9

Series Appeal Subscale, Animation:
Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	30	22.1	3.7	14	22.8	1.5
Girls	40	21.8	3.5	26	21.7	3.1
Latino Students						
Boys	15	20.9	4.6	25	21.8	3.1
Girls	26	21.3	4.5	17	23.1	1.4
Non-Target Students						
Boys	18	21.0	4.3	22	19.3	4.0
Girls	20	21.3	4.1	27	22.6	2.3

Age Group

Note. Series appeal subscale = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n_{total} = 280 = all students for whom complete data were available.

Grand Mean = 21.7

SD = 3.6

Table H.10

Analysis of Variance: Series Appeal Subscale, Animation

Source of Variation	SS	df	MS	F
Main Effects	67.80	4	16.95	1.36
Ethnic Group	38.60	2	19.30	1.55
Age	11.39	1	11.39	0.91
Sex	22.02	1	22.02	1.77
Two-Way Interactions	122.10	5	24.42	1.96
Ethnic Group X Age	27.11	2	13.55	1.09
Ethnic Group X Sex	67.19	2	33.59	2.70
Age X Sex	14.74	1	14.74	1.18
Explained	189.90	9	21.10	1.69
Error	3358.93	270	12.44	
Total	3548.83	279	12.72	

Note. Series subscale score = total number of positive adjectives checked for all eight shows. Maximum score = 24.

n = 280 = all students for whom complete data were available.

$p > .05$ for all F ratios.

APPENDIX I

COMPREHENSION SUBSCALE: FREQUENCY DATA

Table I.1

Comprehension Subscale:

Frequency Data

Group	Age Group					
	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	48	73.7	13.3	17	82.8	8.0
Girls	50	75.6	8.9	27	79.4	9.4
Latino Students						
Boys	23	74.8	12.9	25	77.0	8.8
Girls	32	78.9	13.1	27	82.1	13.8
Non-Target Students						
Boys	22	80.9	7.4	22	78.8	13.4
Girls	24	73.9	10.9	28	80.8	10.5

Note. Maximum score = 100

n_{total} = 345 = all students for whom complete data were available.

Grand Mean = 77.7

SD = 11.6

APPENDIX J

STUDENTS' KNOWLEDGE OF MATH CONTENT: FREQUENCY DATA

Table J.1

Math Content:

Pretest Frequency Data

Group	Age Group					
	Younger Students[a]			Older Students[b]		
	n	M	SD	n	M	SD
Black Students						
Boys	73	9.29	2.42	39	10.28	2.49
Girls	96	8.85	2.89	66	9.85	2.63
Latino Students						
Boys	34	8.26	2.26	56	10.12	2.40
Girls	61	8.49	2.62	68	9.34	2.61
Non-Target Students						
Boys	44	9.27	2.62	36	11.19	3.73
Girls	37	7.67	2.92	50	9.42	3.11

Note. Maximum Score = 20

n_{total} = 660 = all students who completed pretest and post-test and saw at least six of the eight shows.

Grand Mean = 9.31

SD = 2.82

[a] Ten years old or younger.

[b] Eleven years old or older.

Table J.2

Math Content:

Gain Score Frequency Data

Group	Younger Students[a]			Older Students[b]		
	n	M	SD	n	M	SD
Black Students						
Boys	73	2.26	2.93	39	2.38	2.63
Girls	96	2.83	2.85	66	2.70	2.54
Latino Students						
Boys	34	4.59	2.72	56	3.66	3.18
Girls	61	2.34	2.85	68	2.79	3.37
Non-Target Students						
Boys	44	3.47	2.91	36	2.19	2.82
Girls	37	4.05	3.23	50	4.90	2.97

Age Group

Note. Gain Score = Posttest Score - Pretest Score on the 20-item Student Math Content Form.

n_{total} = 660 = all students who completed pretest and posttest and saw at least six of the eight shows.

Grand Mean = 3.07

SD = 3.02

[a] Ten years old or younger.

[b] Eleven years old or older.

Table J.3

Math Content Subscale:

Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	51	66.8	13.7	20	80.8	17.1
Girls	57	68.1	12.9	32	77.3	15.9
Latino Students						
Boys	23	67.0	17.1	30	76.4	13.8
Girls	33	65.6	17.7	29	77.6	16.7
Non-Target Students						
Boys	22	75.4	16.4	26	81.7	13.5
Girls	26	76.0	13.8	34	85.0	15.7

Age Group

Note. Maximum score = 100.

n_{total} = 383 = all students for whom complete data were available.

Grand Mean = 73.8

SD = 16.2

APPENDIX K

STUDENT ATTITUDES:
FREQUENCY DATA

Table K.1

Social and Math Attitudes:

Pretest Frequency Data

Group	Younger Students[a]			Older Students[b]		
	n	M	SD	n	M	SD
Black Students						
Boys	73	9.66	2.63	39	10.67	2.29
Girls	96	11.49	2.18	66	12.27	1.52
Latino Students						
Boys	34	10.00	1.55	56	10.25	2.67
Girls	61	11.70	1.75	68	12.32	1.51
Non-Target Students						
Boys	44	9.41	2.55	36	9.36	2.22
Girls	37	11.76	2.10	50	11.98	1.62

Note. Maximum score = 14

n_{total} = 660 = all students who completed pretest and posttest and saw at least six of the eight shows.

Grand Mean = 11.04

SD = 2.34

[a] Ten years or younger.

[b] Eleven years or older.

Table K.2
Social and Math Attitudes:
Gain Score Frequency Data

Group	Younger Students			Older Students		
	n	*M*	*SD*	*n*	*M*	*SD*
Black Students						
Boys	73	.93	2.27	39	.82	1.96
Girls	96	1.17	1.69	66	.35	1.41
Latino Students						
Boys	34	.76	2.29	56	.30	2.01
Girls	61	.98	1.75	68	-.06	2.02
Non-Target Students						
Boys	44	.57	2.48	36	.53	1.84
Girls	37	.51	2.38	50	.36	1.83

(Age Group spans Younger Students and Older Students)

Note. Gain score = Posttest score - Pretest score on 14-items.
n_{total} = 660
Grand Mean = .63
SD = 1.99

Table K.3
Attitudes Toward Television:
Pretest Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	67	4.81	.61	39	4.82	.51
Girls	91	4.70	.81	65	4.83	.45
Latino Students						
Boys	32	4.56	1.08	53	4.94	.23
Girls	60	4.77	.77	65	4.83	.48
Non-Target Students						
Boys	44	4.75	.44	35	4.71	.62
Girls	37	4.86	.67	50	4.82	.44

Age Group

Note. Maximum score = 5

n_{total} = 638

Grand Mean = 4.79

SD = .62

Table K.4

Attitudes Toward Television:
Gain Score Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	61	-.06	.77	37	.03	.60
Girls	83	.13	.86	63	0	.57
Latino Students						
Boys	30	.33	1.15	52	-.40	1.22
Girls	56	-.09	1.19	64	0	.82
Non-Target Students						
Boys	44	.04	.64	34	-.06	.85
Girls	35	-.17	.75	48	.06	.88

Age Group

Note. Gain score = Posttest score - Pretest score on five items.

n_{total} = 607

Grand Mean = -.02

SD = .89

Table K.5

Attitudes Toward Math:

Pretest Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	67	2.99	1.75	38	3.87	1.44
Girls	90	3.58	1.70	64	3.44	1.65
Latino Students						
Boys	31	3.42	1.82	54	3.22	1.78
Girls	59	3.53	1.76	65	3.95	1.34
Non-Target Students						
Boys	44	3.16	1.89	35	2.74	1.87
Girls	37	3.46	1.73	49	3.16	1.66

Note. Maximum score = 5

n_{total} = 633

Grand Mean = 3.40

SD = 1.71

Table K.6

Attitudes Toward Math:
Gain Score Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	61	.02	1.99	32	-.47	1.90
Girls	81	-.02	1.78	60	-.07	1.48
Latino Students						
Boys	28	.36	1.37	52	.08	1.92
Girls	56	.07	1.55	62	-.19	1.77
Non-Target Students						
Boys	44	-.25	1.77	32	-.12	1.31
Girls	35	.17	1.87	47	.02	1.55

Age Group

Note. Gain score = Posttest score - Pretest score on five items.

n_{total} = 590

Grand Mean = -.04

SD = 1.71

Table K.7

Attitudes Toward Math Television Programs: Pretest Frequency Data

Group	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	66	3.18	1.68	38	3.55	1.78
Girls	93	3.39	1.79	65	3.37	1.62
Latino Students						
Boys	31	2.90	1.92	53	2.87	1.84
Girls	61	3.93	1.49	67	3.79	1.58
Non-Target Students						
Boys	44	2.89	1.83	35	2.46	1.84
Girls	36	3.50	1.89	49	2.90	1.67

Age Group

Note. Maximum score = 5
n_{total} = 638
Grand Mean = 3.28
[illegible] = 1.76

Table K.8

Attitudes Toward Math Television Programs: Gain Score Frequency Data

Group	Age Group					
	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	60	.47	2.23	32	.88	1.68
Girls	85	.44	2.09	61	.92	1.91
Latino Students						
Boys	28	.82	1.95	51	.59	1.89
Girls	58	-.03	1.90	64	.13	1.88
Non-Target Students						
Boys	42	.45	1.94	31	.16	1.57
Girls	34	.56	1.89	47	.49	2.00

Note. Gain score = Posttest score - Pretest score on five items.

n_{total} = 593

Grand Mean = .46

SD = 1.95

Table K.9

Attitude Subscale:

Frequency Data

Group	Age Group					
	Younger Students			Older Students		
	n	M	SD	n	M	SD
Black Students						
Boys	45	74.8	12.7	16	81.6	11.2
Girls	49	75.5	12.7	26	77.8	9.0
Latino Students						
Boys	20	70.0	17.0	24	74.8	14.4
Girls	28	70.4	13.2	23	81.9	13.3
Non-Target Students						
Boys	20	70.8	12.8	22	66.7	16.0
Girls	24	73.1	8.1	26	77.8	10.5

Note. Maximum score = 100

n_{total} = 323 = all students for whom complete data were available.

Grand Mean = 74.6

SD = 13.1

APPENDIX L

TEACHER RESPONSES:
FREQUENCY DATA AND RESULTS OF STATISTICAL ANALYSES

Table L.1

Teacher Semantic Differential: Pre- and Posttest Scores

Concept	M	SD	t
Educational Television			
Pretest	5.226	.774	2.72**
Posttest	5.590	.697	
Math			
Pretest	5.375	.774	1.47
Posttest	5.518	.794	
Television Programs on Math			
Pretest	5.381	.815	1.37
Posttest	5.601	.798	

Note. Each concept was rated on a scale of one (least positive) to seven (most positive) for 20 pairs of bipolar adjectives.

n = 34 teachers.

**p < .01, two-tailed

Table L.2

Frequency Data: Teacher Weekly Questionnaire, Item 37

Show	M	SD
A	77%	42%
B	89%	32%
C	63%	49%
D	63%	49%
E	81%	39%
F	78%	42%
G	67%	48%
H	81%	39%

Note. n = 27 teachers

Table L.3

Analysis of Variance: Teacher Weekly Questionnaire, Item 37

Source of Variation	SS	df	MS	F
Main Effects	16.00	33	0.48	4.02***
Show	1.42	7	0.20	1.68
Linear Term	.00	1	.00	.04
Deviation from Linear	1.41	6	.23	1.26
Teacher	14.61	26	0.56	4.66***
Explained	16.00	33	0.48	4.02***
Error	20.86	173	0.12	
Total	36.86	206	0.17	

Note. Item 37: "This program was educationally effective."

***p < .001

Table L.4

Frequency Data: Teacher Weekly Questionnaire, Item 38

Show	M	SD
A	3.08	.48
B	3.23	.51
C	2.79	.88
D	3.08	.74
E	3.23	.51
F	3.03	.81
G	2.60	.87
H	3.22	.51

Note. n = 27 teachers; Maximum score = 4.

Table L.5

Analysis of Variance: Teacher Weekly Questionnaire, Item 38

Source of Variation	SS	df	MS	F
Main Effects	40.59	33	1.23	3.48***
Show	8.79	7	1.25	3.55***
Linear Term	.24	1	.24	.51
Deviation from Linear	8.55	6	1.42	2.88
Teacher	31.41	26	1.20	3.42***
Explained	40.59	33	1.23	3.48***
Error	61.09	173	0.35	
Total	101.69	206	0.49	

Note. Item 38: "The overall presentation in this week's program was (check one) outstanding/good/mediocre/poor."

***p < .001

Table L.6

Frequency Data: Class Preparation Subscale

Show	M	SD
A	43%	36%
B	56%	32%
C	35%	33%
D	44%	37%
E	37%	41%
F	46%	41%
G	35%	43%
H	43%	36%

Note. n = 27 teachers

Table L.7

Analysis of Variance: Class Preparation Subscale

Source of Variation	SS	df	MS	F
Main Effects	9.51	33	0.28	2.53***
Show	0.86	7	0.12	1.08
Linear Term	.09	1	.09	.65
Deviation from Linear	.76	6	.12	.90
Teacher	8.80	26	0.33	2.97***
Explained	9.51	33	0.28	2.53***
Error	19.71	173	0.11	
Total	29.23	206	0.14	

***p < .001

Table L.8

Frequency Data: Program Guide Subscale

Show	M	SD
A	70%	35%
B	73%	30%
C	59%	42%
D	72%	33%
E	71%	36%
F	63%	42%
G	68%	39%
H	58%	40%

Note. n = 27 teachers

Table L.9

Analysis of Variance: Program Guide Subscale

Source of Variation	SS	df	MS	F
Main Effects	14.70	33	0.44	6.32***
Show	0.78	7	0.11	1.58
Linear Term	0.16	1	0.16	1.27
Deviation from Linear	0.61	6	0.10	0.78
Teacher	13.93	26	0.53	7.60***
Explained	14.70	33	0.44	6.32***
Error	12.19	173	0.07	
Total	26.90	206	0.13	

***$p < .001$

Table L.10

Frequency Data: Program Presentation Subscale

Show	M	SD
A	79%	23%
B	78%	22%
C	66%	28%
D	76%	24%
E	80%	25%
F	81%	21%
G	71%	32%
H	82%	21%

Note. n = 27 teachers

Table L.11

Analysis of Variance: Program Presentation Subscale

Source of Variation	SS	df	MS	F
Main Effects	7.49	33	0.22	8.83***
Show	0.53	7	0.07	2.94**
Linear Term	0.02	1	0.02	.39
Deviation from Linear	0.50	6	0.08	1.46
Teacher	6.97	26	0.26	10.42***
Explained	7.49	33	0.22	8.83***
Error	4.45	173	0.02	
Total	11.94	206	0.05	

**p < .01

***p < .001

Table L.12

Frequency Data: Language Subscale

Show	M	SD
A	87%	26%
B	83%	34%
C	74%	40%
D	83%	28%
E	89%	25%
F	91%	28%
G	87%	27%
H	91%	24%

Note. n = 27 teachers

Table L.13

Analysis of Variance: Language Subscale

Source of Variation	SS	df	MS	F
Main Effects	6.18	33	0.18	2.75***
Show	0.56	7	0.08	1.19
Linear Term	0.16	1	0.16	1.85
Deviation from Linear	0.40	6	0.06	0.78
Teacher	5.61	26	0.21	3.17***
Explained	6.18	33	0.18	2.75***
Error	12.36	182	0.06	
Total	18.55	215	0.08	

***$p < .001$

Table L.14

Frequency Data: Technical Quality Subscale

Show	M	SD
A	69%	42%
B	72%	38%
C	68%	45%
D	78%	40%
E	76%	38%
F	74%	40%
G	80%	37%
H	89%	29%

Note. n = 27 teachers

Table L.15

Analysis of Variance: Technical Quality Subscale

Source of Variation	SS	df	MS	F
Main Effects	12.75	33	0.38	3.78***
Show	1.90	7	0.27	2.66*
Linear Term	1.05	1	1.05	10.29**
Deviation from Linear	0.85	6	0.14	1.39
Teacher	10.92	26	0.42	4.11***
Explained	12.75	33	0.38	3.78***
Error	17.68	173	0.10	
Total	30.43	206	0.14	

*$p < .05$

**$p < .01$

***$p < .001$

Table L.16

Frequency Data: Student Attention Subscale

Show	M	SD
A	94%	16%
B	89%	25%
C	73%	29%
D	70%	32%
E	87%	22%
F	93%	18%
G	78%	32%
H	85%	27%

Note. n = 27 teachers

Table L.17

Analysis of Variance: Student Attention Subscale

Source of Variation	SS	df	MS	F
Main Effects	4.76	33	0.14	2.46***
Show	1.56	7	0.23	3.81***
Linear Term	0.02	1	0.02	0.43
Deviation from Linear	1.53	6	0.25	3.84
Teacher	3.19	26	0.12	2.19**
Explained	4.76	33	0.14	2.46***
Error	10.65	182	0.05	
Total	15.41	215	0.07	

$^{**}p < .01$

$^{***}p < .001$

Table L.18

Frequency Data: Program Appeal Subscale

Show	M	SD
A	84%	23%
B	90%	21%
C	65%	39%
D	74%	35%
E	85%	26%
F	81%	29%
G	76%	32%
H	83%	28%

Note. n = 27 teachers

Table L.19

Analysis of Variance: Program Appeal Subscale

Source of Variation	SS	df	MS	F
Main Effects	8.78	33	0.26	6.13***
Show	0.87	7	0.12	2.89**
Linear Term	.00	1	.00	.03
Deviation from Linear	.87	6	.14	1.84
Teacher	7.92	26	0.30	7.01***
Explained	8.78	33	0.26	6.13***
Error	7.51	173	0.04	
Total	16.29	206	0.07	

**p < .01

***p < .001

Table L.20

Frequency Data: Math Content Subscale

Show	M	SD
A	62%	39%
B	87%	24%
C	71%	32%
D	69%	33%
E	84%	26%
F	77%	35%
G	76%	31%
H	71%	38%

Note. n = 27 teachers

Table L.21

Analysis of Variance: Math Content Subscale

Source of Variation	SS	df	MS	F
Main Effects	7.86	33	0.23	2.78^{***}
Show	1.24	7	0.17	2.08^{*}
Linear Term	0.03	1	0.03	0.28
Deviation from Linear	1.21	6	0.20	1.89
Teacher	6.62	26	0.25	2.97^{***}
Explained	7.86	33	0.23	2.78^{***}
Error	15.56	182	0.08	
Total	23.43	215	0.10	

*$p < .05$

***$p < .001$

Table L.22

Frequency Data: Math Attitudes Subscale

Show	M	SD
A	85%	27%
B	85%	27%
C	70%	37%
D	91%	28%
E	83%	34%
F	81%	28%
G	80%	37%
H	80%	37%

Note. n = 27 teachers

Table L.23

Analysis of Variance: Math Attitudes Subscale

Source of Variation	SS	df	MS	F
Main Effects	7.93	33	0.24	3.01***
Show	0.66	7	0.09	1.18***
Linear Term	0.02	1	0.02	0.25
Deviation from Linear	0.63	6	0.10	1.01
Teacher	7.27	26	0.28	3.50***
Explained	7.93	33	0.24	3.01***
Error	14.52	182	0.08	
Total	22.45	215	0.10	

***p < .001

Table L.24

Frequency Data: Social Attitudes Subscale

Show	M	SD
A	76%	30%
B	75%	29%
C	58%	38%
D	66%	37%
E	81%	30%
F	69%	36%
G	70%	37%
H	74%	35%

Note. n = 27 teachers

Table L.25

Analysis of Variance: Social Attitudes Subscale

Source of Variation	SS	df	MS	F
Main Effects	16.83	33	0.51	10.82***
Show	0.99	7	0.14	3.00**
Linear Term	0.00	1	0.00	0.01
Deviation from Linear	0.98	6	0.16	0.21
Teacher	15.84	26	0.60	12.93***
Explained	16.83	33	0.51	10.82***
Error	8.57	182	0.04	
Total	25.40	215	0.11	

$^{**}p < .01$

$^{***}p < .001$

APPENDIX M

PROGRAM GUIDES

INTRODUCTION TO PROGRAM GUIDES
PROGRAM GUIDES, SHOWS A TO H

INFINITY FACTORY

INTRODUCTION
TO
PROGRAM GUIDE

About the Series

Infinity Factory is a television series -- half-hour programs about mathematics, about people, and especially about people using mathematics. Stressing neither "new math" nor "old math," the programs instead emphasize realistic uses of mathematics -- *when* to use mathematics, and *what for*, not just *how*. Each program shows people using and exploring mathematics in many different kinds of situations, showing the audience how mathematics can be helpful in their own lives.

The series is mainly for children, especially Blacks and Latinos, aged roughly eight through eleven.

In addition to mathematics, the series addresses a range of cultural concerns. The audience will gain a sense and appreciation of the diverse and valuable contributions that minority peoples bring to American life. And by seeing men and women, boys and girls from many backgrounds and cultures using mathematics constructively, viewers will come to understand how mathematics is important for everyone.

In the classroom, the series creates a link between mathematics instruction and the world outside the school. It helps children understand why they are learning mathematics; it changes and broadens their perspectives on what mathematics is about; it brings new dimensions to their understanding of mathematical skills and concepts.

About the Programs

Each program consists of several short segments, centering around a main mathematical theme that usually involves two or three skills or concepts. The many segments in each program treat this mathematical theme from different perspectives, developing the mathematics in several related ways. In addition, each program gives teachers the opportunity to branch out into several other topics, both in mathematics and in other areas as well.

Basic arithmetic facts appear several times in each program.

Although no two programs are the same, several regular features recur from show to show:

The series has a cast of children acting in short skits. Most of these take place in or around an urban "Brownstone" apartment house built in a television studio. The skits make points about math and people, several times in each program.

There is "Scoops' Place" – live-action, dramatic segments about a Black family who run an urban neighborhood store. We see them dealing with each other's needs and with the world outside the store, overcoming difficulties, resolving conflicts, and generally mirroring the lives of many viewers. Their solutions to problems emphasize the usefulness of mathematics.

"City Flats," also live action, concerns a Latino family operating a bakery in East Los Angeles. This slice of life in an urban barrio shows mathematics at work in people's everyday lives, and brings out human relationships that underscore important points about community and culture.

Animated cartoons help make certain mathematical ideas clear, in ways that appeal to imagination and humor. The animated pieces often teach directly, using the techniques of animation to present mathematical situations in their bare essentials.

Every program features a historical fact introduced in a "Brownstone" skit with the young cast. Each of these points out an important contribution made by a notable minority person, often in a field involving mathematics.

Some programs include "Math in the Street" interviews -- fast-paced, spontaneous responses from many people to a question about mathematics. We see that sometimes there is more than one good answer in mathematics, depending on one's viewpoint. And sometimes, we hear occasional wrong answers among the good ones.

Film documentaries show children and adults going about their jobs and avocations, using mathematics. We look over people's shoulders as they apply mathematical skills and concepts to their own needs.

In all, each program explores many sides of a main mathematical idea through a variety of production techniques, providing the viewer with many related images that together help convey an improved understanding of the mathematics, and of cultural concerns as well.

The programs use a variety of language styles. Most of the characters speak standard English, but the occasional use of the language forms familiar to the minority communities, including "Black English" and "barrio Spanish," may surprise some viewers. To learn mathematics from the series, minority students must first understand the programs and find them appealing. The language balance helps accomplish this goal without hindering viewers who speak standard English.

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About the Goals

The mathematics presented through *Infinity Factory* can mesh well with classroom work. The programs use the same words and symbols that most teachers do, showing realistic and useful applications of the mathematics taught in many classrooms.

Television can help classroom teachers provide a rich set of images and experiences that bring mathematics alive and make it real. And television programs are a fruitful basis for class discussion and classroom activities.

Infinity Factory mathematics concentrates on five main areas:

1. Decimal Number System

These topics include some simple arithmetic – addition, subtraction, multiplication, and division -- showing how numbers interact, with a stress on rounding off and approximating. Some segments address the question of *which* arithmetic operations or approximations to use in a given situation, and the "math facts" in each program review the operations basic to computation.

2. Measurement

Several of the programs introduce viewers to the usefulness of measuring, and include measurement concepts, techniques, and the use of instruments, with a particular emphasis on the metric system.

3. Estimation

The programs show estimation as a useful skill, looking at whether estimates are good enough in particular situations. Also, learning to estimate can help viewers gain an intuitive sense of scale for numbers and for units of measurement.

4. Mapping and Scaling

Many students enjoy maps and scale models, and appropriate television presentations can help this enjoyment develop into an understanding of scale. Teachers may build on this to introduce the notions of ratio and proportion, and to make maps more accessible as a tool.

5. Graphing

Graphs are a visual medium within mathematics -- a useful way of recording and using information. The graphing programs often show graphs of events over time, because these are in very common use. Other topics include coordinate systems and finding specified points in the plane.

Intertwined through all the mathematical areas are some useful ways to solve problems: techniques that apply to problems in many areas. We present some of these methods to encourage viewers to think creatively and constructively about the problems they encounter themselves.

Along with the mathematics, *Infinity Factory* addresses a set of cultural and ethnic goals that reflect special needs of minority children in the audience. Among these goals are . . .

- — presenting Black and Latino role models who show positive, realistic aspects of cultural confidence and pride;
- — helping each viewer to reinforce good feelings about his or her own group, and to accept people and relationships in other groups;
- — representing the inner city environment, both for urban audiences and for suburban and rural viewers;
- — stressing the humanistic perspectives of sharing, cooperation, equality, and self-respect.

The series is about children. It makes frequent use of minority characters, settings, situations, and art forms, so that Black and Latino viewers in particular can feel the series is about them and for them, saying something about their lives.

About the Guides

Besides this introductory folder, there is a separate, single sheet guide for each program in the series.

On each program sheet, the section called "Main Math Ideas" gives the mathematical concepts we want viewers to carry away after the show.

Under "Some Highlights" are synopses of a few segments in the program, usually mentioning some of the math involved. Some guides also give the lyrics for a song in the program.

Discussions or activities "Before the Program" can often help to focus students' curiosity and attention. The guides offer some possibilities.

Afterwards, follow-up activities can reinforce and consolidate the program content, and can also help tie the program material to ongoing classroom instruction. In the section called "After the Program," the guides offer examples of activities and discussion topics. These are only suggestions; many teachers will doubtless undertake other activities with their classes.

Because they offer a wide variety of people, settings, and situations, the programs usually touch on math beyond the stated main ideas. The section called "Tangents" lists some of the mathematical points teachers can develop further with their classes, often in the form of activities. Sometimes the "Tangents" will help teachers tie in the programs with their own instructional plans. In many guides, this section also includes useful non-mathematical points that arise in the programs.

Under the heading "Other Suggestions," the guides mention activities in addition to those elsewhere on the sheet.

Finally, listed on each sheet are the basic arithmetic "Math Facts" that appear in the program.

In a class period 50 minutes long, this is one possible way to schedule the program and activities:

5 minutes: Before the Program -- questions and activities to arouse students' curiosity;
30 minutes: Viewing the program;
15 minutes: After the Program -- questions and activities that build on program material.

Some activities can carry over into other class periods, and can relate to other subjects, such as science, if the teacher decides their educational value is worth the investment of extra time.

Students also may be interested in these guides; you may want to post them in the classroom.

Both the television shows and these guides are mainly jumping-off points for teachers and students. Nothing on the screen or in the guides is obligatory, for every teacher is best qualified to judge what will work well in his or her classroom. No two teachers will use these programs in exactly the same way.

Indeed, one important advantage of good classroom television is its rich mix of images, ideas, and experiences. There is probably more "raw material" in the series than any single teacher will have time to develop and use completely. This means that teachers can pick and choose among the concepts and skills presented, tailoring their use of the series to their own particular wishes, styles, and needs.

We at *Infinity Factory* earnestly request that teachers write us about their experiences with the programs. How teachers use the programs, the activities that people try, and students' reactions are all important to us. We shall use this information in preparing further editions of these guides, and in planning other television series for the future. Please write: Guides, Infinity Factory, EDC, 55 Chapel Street, Newton, Mass. 02160.

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INFINITY FACTORY

Program 8

Time

Helpful Materials

Stopwatch, or a wristwatch with a second hand

Thread and small weight

Paper cup

Two candles the same size

Main Math Ideas

Need for measuring time

Minutes and seconds as units of time

Before the Program

Some questions to think about:

How do you know when it's time to . . .

-- get up in the morning?
-- leave for school?
-- eat lunch?
-- eat dinner?
-- do your homework?
-- go to bed?

If you don't have a clock, how can you tell how long 30 seconds is?

Some Highlights

Math-In-The-Street: If you don't have a clock, how do you know what time it is?

Scoops' Place: Prettyboy realizes the importance of telling time when he is dropped from Kung Fu class for being late often.

City Flats: Loli, Apple, and Tito have to measure time when baking a cake for Mama Lupe and Don Julio's anniversary.

Math-In-The-Street: How long is a while?

Animation: The face of a clock is used to show the importance of the minute hand.

After the Program

Some questions to think about:

How might these people measure time in their work?

-- Nurse
-- Baker
-- Track star
-- Photographer
-- Chemist
-- Musician
-- Television producer
-- Radio disc jockey
-- Ceramist
-- Aircraft controller
-- Pilot
-- Astronaut

The class might enjoy building a seconds pendulum. Take a piece of thread about 4 feet long and tie a small weight to the end. Tie the thread to something so the weight hangs down exactly 39 inches. It will take just about a second for the pendulum to swing from right to left. Check with a watch to see if 60 swings take a minute. If the pendulum is too slow, shorten the thread and check the timing again. Always use short swings back and forth.

Children can estimate seconds fairly accurately by counting, "One thousand one, one thousand two, ..." Check 60 of these counts against a watch.

Other Suggestions

Set up a race in the classroom and have students use a stopwatch (or watch with a second hand) to record each person's time.

How long can you stand on one foot with your eyes closed? Have students time each other.

Signal the class to start estimating, and tell each student to say "Now" when he or she thinks 30 seconds is up. How much do people disagree?

Make a tiny hole in the side of a paper cup near the bottom. Cover the hole with your finger while you fill the cup with water. Then measure the time it takes for the water to run out. How could you use this as a clock?*

Teacher demonstration: Using two candles of the same size, burn one and measure its length every ten minutes. Mark these lengths on the other candle. How can the second candle serve as a clock?*

*At one time, these were the best clocks available.

Tangents

Can the class figure out a way to use the sun for telling time?

If you use the sun to tell time, what happens on a rainy day?*

Math Facts

2:40 is the same as 20 minutes to 3.

5:35 is the same as 25 minutes to 6.

Three-quarters past 5 is the same as 5:45.

10:45 is the same as a quarter to 11, or three-quarters past 10.

Notes

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INFINITY FACTORY

Program 4

Approximation

Helpful Materials

Mail-order catalog

Main Math Ideas

How to round off numbers

Advantages of rounding off

Application of rounding off when adding

Some Highlights

Brownstone: Can you round this number to its closest 10? A song explains how.

Animation: A caveman rounds off the number 521 to 500 – to the nearest 100.

Documentary: A newspaper boy rounds off to figure out how much money he needs for a new bicycle.

City Flats: Apple rounds off to add up the money the children need to open a raspadas stand.

Animation: A round-off song gives the rules for rounding numbers between 1 and 100.

Scoops' Place: The children try to discover Scoops' "secret method" for adding numbers quickly – rounding off.

Before the Program

When people add up numbers, do they always need an exact answer?

What are some times when an exact answer is not necessary?

Tangents

7 rounded to the nearest 10 is 10.
21 rounded to the nearest 10 is 20.
35 rounded to the nearest 10 is 40.
3 rounded to the nearest 10 is zero.
Does this mean an octopus has 10 legs?
Or that a kitten has no legs?

In City Flats, fortunately, Apple's approximation came out to $2 more than the children needed to open their raspadas stand. How can you avoid approximating less money than you need?

In a Brownstone skit, the concert promoter rounded off 36,000 seats to 40,000, and sold 4,000 more tickets than the stadium would hold. Why was this not a good time to round off?
–– What are some other times when rounding off is not a good idea?

After the Program

Some questions to think about:

–– When do you use approximation? (Explain word "approximation.")

–– Do you know someone who uses approximation?

–– When do other members of your family approximate?

Using a mail-order catalog, approximate the cost of a complete outfit for yourself by rounding off and adding.

Other Suggestions

Some questions to think about – it may help to round off:

-- About how many hours in a day?

-- About how many hours in a week?

-- About how many hours in a month?

-- About how many hours in a year?

-- About how many hours do you spend on homework in a day? A week? A month? A year?

-- About how many hours do you spend at school in one month?

-- About how many hours do you spend watching television in one month?

Math Facts

$4 \times 7 = 28$

$7 \times 4 = 28$

$28 \div 4 = 7$

$28 \div 7 = 4$

Notes

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PROGRAM GUIDE: SHOW C

INFINITY FACTORY

Program 6

Weight

Helpful Materials

Bathroom scale
Postage scale
Bucket
(Metric scales are preferable, if available.)

Main Math Ideas

The kilogram as a unit of weight

Measuring weight with a scale

The importance of measuring weight

Some Highlights

Animation: A little girl weighs her trunks at the airport.

Scoops' Place: Allieboy shows off his strength by lifting weights.

Documentary: A receiver at the Los Angeles Produce Market shows how vegetables get from farms to the stores.

Animation: Contestants on a game show guess which object weighs closest to one kilogram.

City Flats: Using a scale in different ways, Apple and Loli come up with the same weight.

Math-In-The-Street: What is a kilogram?

Before the Program

About how much do you weigh?

When was the last time you stepped on a scale?

What is the greatest number of pounds you can lift?

Can you think of something that weighs about a pound?

After the Program

Why are weights important when:

-- sailing a boat?
-- flying an airplane?
-- building a bird's nest?
-- flying a kite?
-- boxing?
-- designing a house?
-- making up prescriptions?
-- buying meat?
-- mailing a package?

Using a postage scale, have students weigh 100 sheets of paper. How much does one sheet weigh? Then, what does one-half sheet weigh? One-fourth of a sheet? How far can you go?

Tangents

A sign in an elevator says, "SAFE CAPACITY 1500 POUNDS." About how many people can ride safely?

Can you tell how heavy something is by looking at it?

In Scoops' Place, why was Allieboy able to fool people about his ability to lift heavy weights?

In City Flats, was Apple's method for weighing the masa correct? Was Loli's correct?

Weigh two gallons of water in a pail. Ask students to figure out the weight of just the water, without counting the pail. What would a pint of water weigh?*

*A U.S. pint of water weighs one pound. A fluid-ounce of water weighs one ounce. These facts are sometimes helpful in estimating. (Also: a liter of water weighs one kilogram, and a cubic centimeter [or milliliter] of water weighs one gram.)

Other Suggestions

Have students find these weights – first by estimating by sight, and then using a bathroom scale or postage scale to find a more exact weight.

-- About how much does one of your classmates weigh? ________
Actual weight: ________

-- About how much do two of your classmates weigh? ________
Actual weight: ________
(Do you have to weigh them both at the same time?)

-- About how much does the whole class weigh?

-- About how much does a pencil weigh? ________
Actual weight: ________
(If one pencil does not register on the postage scale, you may have to weigh several and divide the total weight by the number of pencils.)

-- About how much does a paper clip weigh? ________
Actual weight ________
(See note above, on weighing pencils.)

-- Weigh other objects in the classroom, estimating first.

Remind students that every measurement of weight must have a unit!

Math Facts

7 + 6 = 13
6 + 7 = 13
13 – 7 = 6

Notes

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INFINITY FACTORY

Program 2

Mapping and Scaling

Helpful Materials

A map of the neighborhood or city

A very large sheet of paper — as large as possible

Main Math Ideas

The concept of scaling

Using maps to plan routes

Relationships between maps and reality

Before the Program

Have you ever been lost?

-- How did you find your way?

-- Do you think a map would have helped you?

Some Highlights

Animation: A tiny car follows a highway on a huge map.

City Flats: The children learn about scaling as they paint a large wall mural from a small sketch.

Brownstone: Two of the children have trouble with proportion as they draw sketches.

Animation: Map Man rescues lost travellers by showing them how to read a map.

Scoops' Place: Sister Stokes uses a map to plan the parade route for the Youth Service Day march and rally.

Documentary: Two children use landmarks on a map to find their way around an amusement park.

After the Program

Bring a map of your neighborhood to school.

-- First, find your school.

-- Then find where you live.

-- Show your route to school.

-- Who lives farthest from school?

-- Who lives closest?

On a very large sheet of paper (floor size, if possible), or on a large blackboard, have students design a city.

-- Where should the people live?

-- Where should the factories be? The parks? The schools? The airport?

-- Are there rivers or shorelines?

-- Which are the main streets?

-- Where should the highways come into the city?

-- Where will people park their cars?

-- Where should the buses or subways run?

-- Where should the fire stations be? The hospitals? — and so forth.

Tangents

Map Man says, "To find out where you're going, you must first find out where you're at."

-- How does this help in using a map?

-- How does this help in everyday life?

When are maps more useful than written directions?

Students might enjoy enlarging a small sketch by drawing half-inch squares over the sketch, and then copying the sketch onto a blackboard ruled off in 6-inch squares.

The next time you use an overhead projector, see if students can figure out how much it magnifies.

-- What makes it magnify more and less?

-- What is the least and most it can magnify?

Math Facts

$9 + 8 = 17$ $17 - 8 = 9$
$8 + 9 = 17$ $17 - 9 = 8$

Other Suggestions

How might these people use a map?

-- school bus driver

-- captain of a ship

-- airplane pilot

-- road builder

Have students sketch a floor plan of the classroom, showing teacher's desk, students' desks, blackboard, file cabinet, doors, windows, etc.

-- Is there another good way to arrange the furniture?

-- Suppose there were five more desks? Where should they go?

-- Suppose you had to keep an elephant in the classroom.

-- Where is the best place to put it?

Notes

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INFINITY FACTORY

Program 5

Graphing

Helpful Materials

Graph paper
Opaque Projector

Main Math Ideas

Graphs as a useful tool for recording and looking at information

Graphs for showing a visual relationship between two variables

Some Highlights

Animation: A caterpillar uses coordinates to find a leaf on a graph.

Scoops' Place: Donna uses a graph to show that she runs fast enough to be on the boys' track team.

City Flats: Apple draws a wrong conclusion about a graph of the store's daily profits.

Before the Program

Some questions to think about:

Have you ever had to keep a record of anything for a long time?
How did you do it?

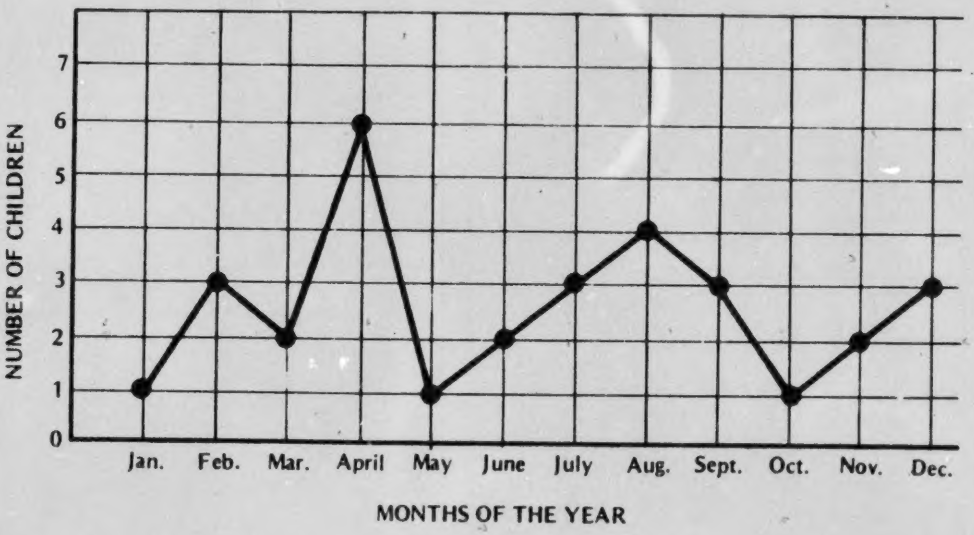
Can you think of people who keep daily records? (Weather forecasters, storekeepers, doctors, athletic coaches, kids interested in baseball, etc.)
How do they record information?

Does anyone know what a GRAPH is?
(Write the word on the board.)

After the Program

How many people in the class were born in November? In July?

Suggest to the class that they make a graph like this one:



Some questions to think about:
In which month were the most people born?

What are some of the things that this graph does not tell you about children in the class? (Does it tell what day of the month people were born, or the ages of people in the class?)
What else doesn't it tell you?

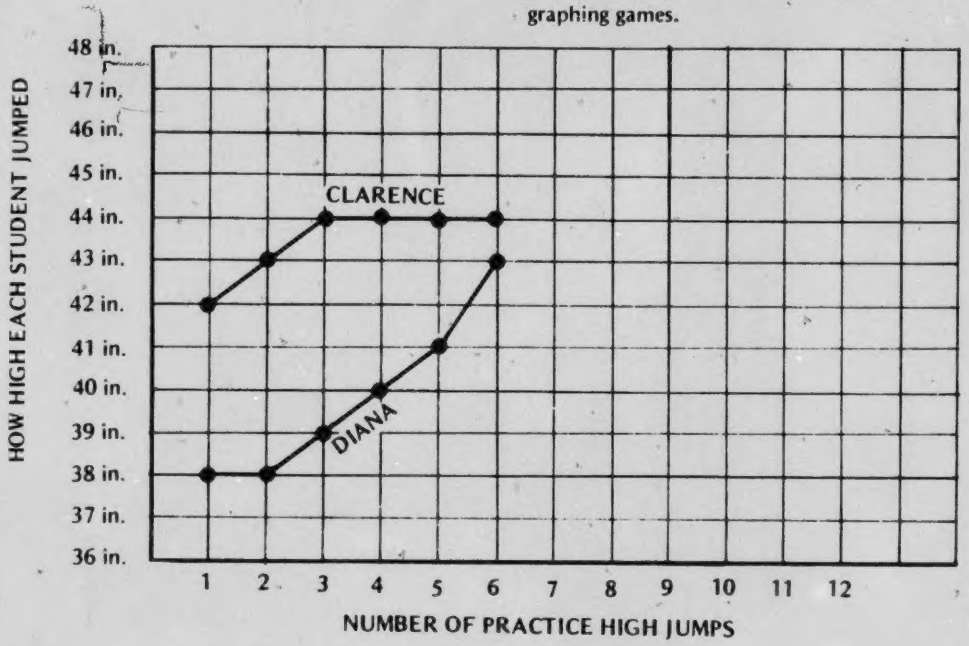
Ask students how many hours of television they watch each day. Have them plot this information on a graph over one or two weeks, day by day.

Tangents

Can students think of ways that graphs might keep them out of trouble?

Other Suggestions

Diana and Clarence were practicing high jumps. They used a graph to record how high they jumped each time. (This can be shown on an opaque projector.)



Some questions to think about:

Who jumped the highest?

Who improved the most?

Who may be jumping higher after a lot more jumps?

What are some things this graph does not tell you?

A student can do several standing long jumps and make a graph that shows his or her progress.

Have students bring graphs to class from magazines and newspapers. Select some interesting ones to look at in class.

There are many graphing games, such as tic-tac-toe played on coordinate points rather than spaces. Check with your curriculum supervisor concerning other graphing games.

Notes

Math Facts

6 x 7 = 42	7 x 6 = 42
42 ÷ 7 = 6	42 ÷ 6 = 7

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INFINITY FACTORY

Program 7
Estimation of Quantity

Helpful Materials

Front page of a newspaper

Main Math Ideas

Estimation as a tool for making everyday judgments about "how many" or "how much."

Many ways in which people can estimate quantity.

Some Highlights

Animation: About how many hairs on a dog? Two fleas estimate.

Math-In-The-Street: About how many hairs on your head?

City Flats: Apple, Loli, and their mother use a scale to estimate the number of chocolate squares in a basket.

Animation: Talking to a policeman, a woman estimates the height and weight of her two-year-old monster.

Math-In-The-Street: About how many bones in your body?

Scoops' Place: Scoops, Miss Marie, and Sister Stokes estimate whether Scoops' Place can hold 45 people for a meeting.

Before the Program

Some questions to think about:

About how many hairs are there on your head?
  How did you get your answer?
  Was it a guess?
  Does anyone know what ESTIMATION is? (Write the word on the board.)
  What is the difference between a "wild guess" and an "estimate"?
About how many children are in school today?
About how many words are on the front page of a newspaper ?

After the Program

About how many words are on the front page of a newspaper?
  Some possible starting points:
  There are about 5 letters in an average word.
  About how many words in a line of print?
  About how many words in a piece of column one inch long?
  About how many words in a whole column?
Can students think of any other ways to estimate the number of words on a page?

Think about it . . . . .

About how many kids in the world?

About 1 billion kids in the world.

About 150 countries in the world.

About 220 million people in the U. S.

About 200 bones in the adult human body.

About how many bones in the U. S. ?

About 1,800 daily newspapers in the U.S.

About 5,000 words on the front page of a newspaper.

About how many words in an entire newspaper?

About 100 eyelashes per eye.

About how many eyelashes in the U.S.?

About 100,000 hairs on the normal human head.

About how many normal human heads?

Tangents

According to Scoops, there was not enough room in the store for 45 people. Was he close?

At least 45 people attended the meeting at Scoops Place. Would there have been room for more people? About how many more? How could they have squeezed in?

When the children in City Flats estimated 300 chocolate squares, were there *exactly* 300? After the customer bought 12, was 300 still a good estimate?

Does a child have the same number of bones as an adult?

Other Suggestions

Have students estimate how many children in school are wearing sneakers today. About how many have a pet? About how many have younger sisters?

What happens if you estimate badly:

- The number of people coming to a party?
- How many minutes it will take you to get to school?
- How cold it is outside?
- How much you can eat in a restaurant?

Write a description for a policeman about a missing friend.

Math Facts

$7 \times 9 = 63$
$9 \times 7 = 63$

$63 \div 7 = 9$
$63 \div 9 = 7$

Notes

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Program 13

Weight

Helpful Materials

A sheet of typing paper torn in quarters, to let students feel about how much a gram weighs

Bathroom scale

Metric scale, if available. Otherwise, to make a metric scale: postage scale, empty half-gallon milk carton, masking tape, and measuring cup

Main Math Ideas

Names of metric units of weight: grams and kilograms

Conversion between kilograms and pounds

Some Highlights

Math-In-The-Street: "How much do these animals weigh?"

Animation: A little girl weighs her trunks at the airport.

Scoops' Place: Metric weights confuse Miss Marie when she weighs her luggage for a trip to Africa.

Brownstone: Danny explains that a dollar bill weighs about one gram.

Math-In-The-Street: "Can you guess how much a house weighs?"

City Flats: Apple thinks his father's new scale is broken until he finds out it weighs in kilograms, not pounds.

Before the Program

Take a sheet of ordinary typing paper and tear it into four equal parts. Each piece weighs about one gram. Crumple each piece and pass them around the room to acquaint each student with about how much a gram weight is.

What objects would weigh about 10 grams? 100 grams? One kilogram? (One thousand grams make up 1 kilogram, about 2.2 pounds.)

After the Program

This is one way to make a metric scale from an ordinary postage scale:

-- Cover the ounce markings on the postage scale with masking tape, but let the zero mark show.

-- Place an empty half-gallon milk carton on the scale, and adjust the scale so it points to zero.

-- With the measuring cup, measure out 3½ ounces of water. Pour it into the milk carton and mark "100 grams" on the masking tape next to the pointer.

-- Add 3½ ounces more water, and mark "200 grams."

-- Keep adding 3½ ounces of water for each 100 grams. Continue until the milk carton is full, or until the scale reaches its maximum.

-- Remove the carton, and reset the scale to zero.

-- Find these other points by eye, and mark them on the masking tape: the 50 gram point, 150 gram point, 250 gram point, and so on.

-- The metric scale is ready. It is not exact, partly because 3½ ounces of water weighs *approximately* 100 grams. (Actually, it is closer to 99 grams.)

Have students weigh small articles in grams. Have them label each article with its approximate weight in grams.

On the back of this sheet is a graph for converting weights from pounds to kilograms. Explain to students: On the horizontal scale, find the weight in pounds you wish to convert. Go straight up from that weight until you reach the heavy line. From there, go straight left until you reach the kilogram scale. That gives, in kilograms, the weight you started with. For example, 100 pounds should come out to about 45 kilograms.

Students might enjoy weighing themselves on an ordinary bathroom scale and expressing their weights in kilograms.

Some questions for discussion:

-- How might these people in our country use the metric system?

International airline pilot
Postal worker
Exporter of molasses (or other packaged food)
Importer of French perfume
United Nations interpreter

Tangents

In Scoops' Place, Max says, "Pretty soon the metric system will replace the old pound system." Ask students:

- —— How will shopping for groceries change?
- —— Will all the scales have to change?
- —— Will everybody have to learn about kilograms?

When a man stepped on a scale once, it read 70. He thought this meant 70 pounds. Because he weighed a lot more than than, he decided the scale must be broken. Then someone told him that it weighed in kilograms, not pounds. "Oh," he said, "no wonder the people in Europe are so thin."

- —— Where was his mistake?

(The story is true.)

In the Brownstone, Zach says, "If I stand on the scales, I weigh 39 kilograms. But what would it tell me if I sit on it?"

- —— Have students try it and see.
- —— Does standing on one foot give the same answer?
- —— What would standing on your head give?

(Readings on the scale may depend on just where on the platform the weight is applied.)

A dollar bill weighs about a gram. What does a ten dollar bill weigh?

A nickel weighs about five grams. Does this mean a penny weighs a gram?

When the United States changes to the metric system, what will happen to sayings like, "An ounce of prevention is worth a pound of cure"?

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Other Suggestions

Have students bring in grocery articles that have their weights marked in grams or kilograms.

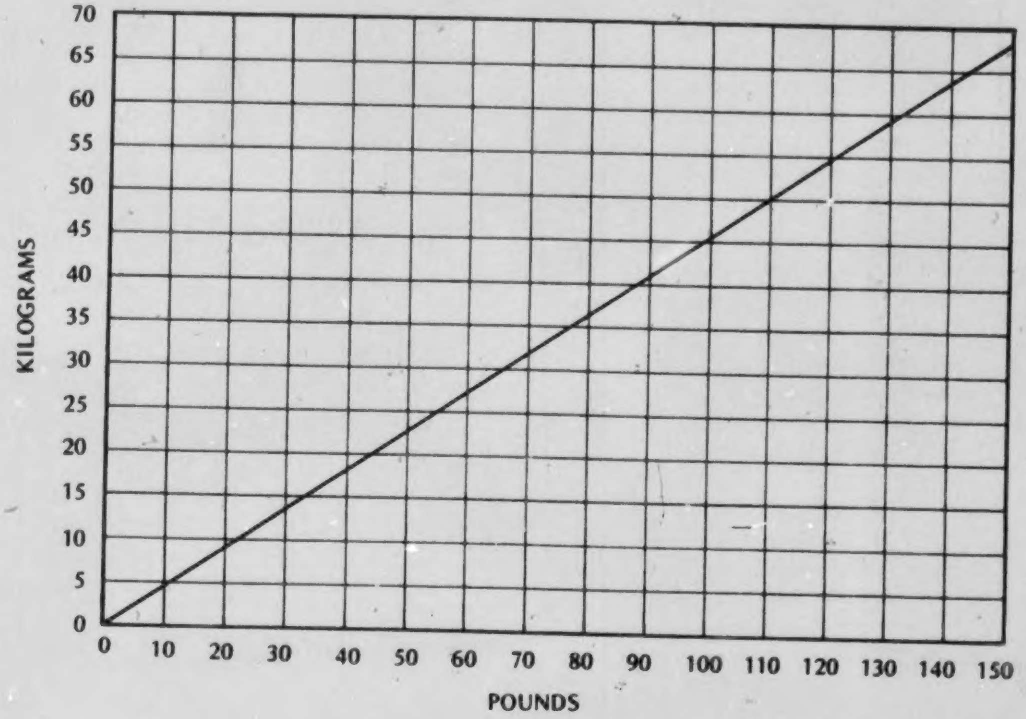
- —— Why are they marked this way?
- —— Students can check these weights on the metric scale. (Remind them that the marked weight does not include the can or package.)

Have students bring in something that weighs about a gram, and about a kilogram.

Math Facts

4 x 9 = 36
9 x 4 = 36

36 ÷ 4 = 9
36 ÷ 9 = 4



INFINITY FACTORY

Program 15

Mapping and Scaling

Helpful Materials

Maps of the neighborhood, town, state –– whatever is available

A very large sheet of paper

Main Math Ideas

Proportion in maps
The concept of scaling in maps
Calculating distances from a map, using the scale

Some Highlights

Animation: A tiny car follows a highway on a huge map.
Brownstone: The children estimate distances using maps.
City Flats: On a bicycle trip, Apple and Cindy discover their map is wrongly drawn.
Animation: Mapman rescues a lost traveler by showing him how to read the scale on his map.
Scoops' Place: Gregory helps Albert make scale plans for a doghouse; then Scoops shows them how just changing the scale can make the doghouse bigger.
Documentary: David, who is blind, uses a "tactile map" –– a map he can feel –– to find his way around.

Before the Program

Some questions to think about:

What are some meanings for the word "scale"?

How can a big globe and a little globe represent the same world?

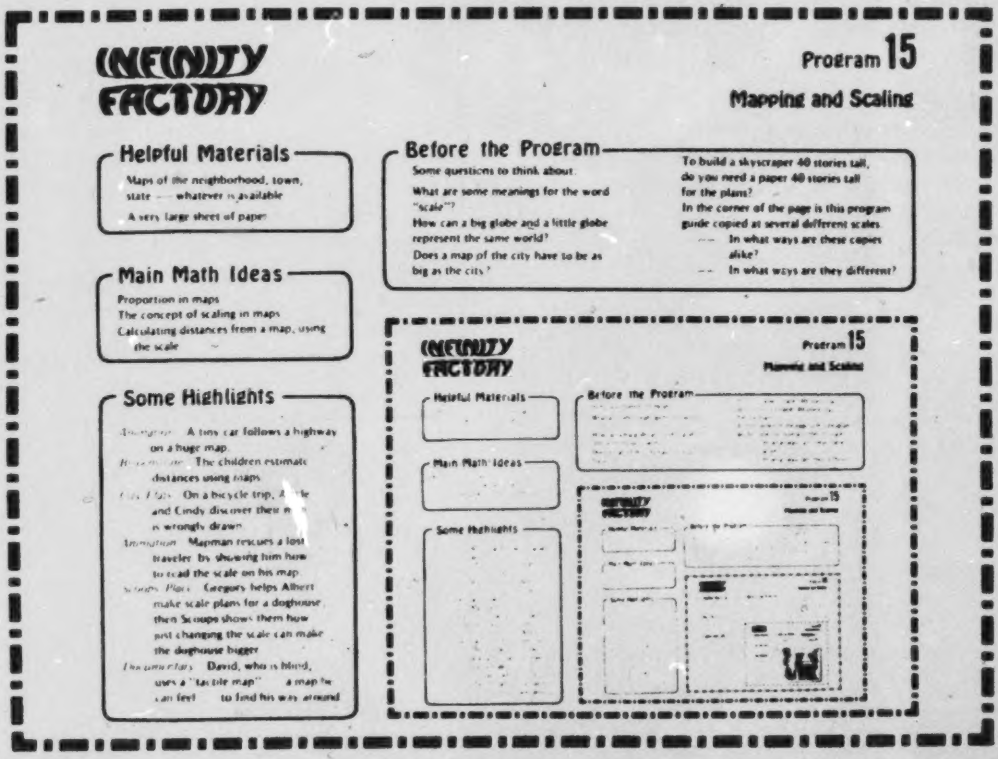
Does a map of the city have to be as big as the city?

To build a skyscraper 40 stories tall, do you need a paper 40 stories tall for the plans?

In the corner of the page is this program guide copied at several different scales.

–– In what ways are these copies alike?

–– In what ways are they different?



INFINITY FACTORY

Program 15

Mapping and Scaling

Helpful Materials

Maps of the neighborhood, town, state –– whatever is available

A very large sheet of paper

Main Math Ideas

Proportion in maps
The concept of scaling in maps
Calculating distances from a map, using the scale

Some Highlights

Animation: A tiny car follows a highway on a huge map.
Brownstone: The children estimate distances using maps.
City Flats: On a bicycle trip, Apple and Cindy discover their map is wrongly drawn.
Animation: Mapman rescues a lost traveler by showing him how to read the scale on his map.
Scoops' Place: Gregory helps Albert make scale plans for a doghouse; then Scoops shows them how just changing the scale can make the doghouse bigger.
Documentary: David, who is blind, uses a "tactile map" –– a map he can feel –– to find his way around.

Before the Program

Some questions to think about:

What are some meanings for the word "scale"?

How can a big globe and a little globe represent the same world?

Does a map of the city have to be as big as the city?

To build a skyscraper 40 stories tall, do you need a paper 40 stories tall for the plans?

In the corner of the page is this program guide copied at several different scales.

–– In what ways are these copies alike?

–– In what ways are they different?

After the Program

On a very large sheet of paper, have students draw a floor plan of an apartment to scale, showing bedrooms, kitchen, bath, and living room.

If the paper is very large –– three or four feet on a side –– try a scale of 1 inch to 1 foot. Otherwise, try 1 inch to 2 feet. The appropriate scale will depend on both the size of the paper and the size of the "real" apartment.

Have students check that the doors and hallways are wide enough, that each room is a good size for its purpose, and so on.

Have students bring in a map of the neighborhood or city and find the distance from their homes to:

-- the school
-- the nearest hospital
-- the fire station
-- the post office
-- points of local interest

Math Facts

4 x 8 = 32
8 x 4 = 32
24 ÷ 4 = 6
24 ÷ 6 = 4

Tangents

In City Flats, why did Apple assume the mechanic was a man?

Do you know of a woman mechanic? A woman pilot? A woman boxer? A woman construction worker? What other fields have women recently begun to explore?

In a Brownstone segment, Michael says, "That's only about one inch from here. That's one mile from here." What did he mean?

Other Suggestions

For Students:

How wide is your town, east to west?
How long is your town, north to south?
Your state?

What countries would you most like to visit? About how far away are they from where you live?

You might ask your students to pick one place they would like to visit. How would they travel –– by car, bus, plane? How many miles would they travel in a day? Where would they stop along the way? Students might want to contact travel agencies or bureaus of tourist information to obtain maps for planning the trip.

About how many blocks in your city make up one mile? (How could students find out without walking the whole mile?)

Are there any interesting places less than one mile away from the school?

Notes

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APPENDIX N

Descriptive Statistics, Show-by-Show Analysis:
Show A

Student Attention

Student Appeal

Show Overall

Brownstone Segments

City Flats

Scoops' Place

Teacher Responses

Related Classroom Activities

Table N.1

Student Attention: Show A

Part of Show	Students Attending and/or Responding	
	M	SD
Show Overall	93%	8%
Major Segments		
Math in the Street #1	92%	11%
Scoops' Place	94%	8%
Historical Segment	95%	6%
City Flats	96%	7%
Math in the Street #2	69%	36%

Note. n = 37 classes.

Table N.2

Student Appeal: Show A Overall

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	207	2.85	.44	132	2.91	.44	339	2.88	.40
Latino Students	120	2.85	.50	155	2.82	.48	275	2.83	.48
Non-Target Students	105	2.80	.56	97	2.75	.58	202	2.78	.57
Total	432	2.84	.49	384	2.83	.47	816	2.84	.48

Note. n_{boys} = 364
M = 2.79
SD = .53
n_{girls} = 452
M = 2.87
SD = .43

Table N.3

Student Appeal: Brownstone Segments, Show A

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	202	2.78	0.58	128	2.81	0.47	330	2.79	0.54
Latino Students	121	2.77	0.59	145	2.72	0.56	266	2.74	0.57
Non-Target Students	104	2.72	0.69	98	2.69	0.68	202	2.71	0.68
Total	427	2.76	0.61	371	2.75	0.57	798	2.75	0.59

Note. n_{boys} = 358
M = 2.70
SD = .62
n_{girls} = 440
M = 2.80
SD = .55

Table N.4

Student Appeal: City Flats, Show A

Group	Age								
	Younger Students			Older Students			Total		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	206	2.71	0.62	126	2.71	0.68	332	2.71	0.64
Latino Students	119	2.75	0.46	154	2.68	0.59	273	2.71	0.54
Non-Target Students	105	2.64	0.70	95	2.72	0.61	200	2.68	0.66
Total	430	2.71	0.60	375	2.70	0.63	805	2.70	0.61

Note. n_{boys} = 360

M = 2.65

SD = .65

n_{girls} = 445

M = 2.74

SD = .57

Table N.5

Student Appeal: Scoops' Place, Show A

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	192	2.15	1.08	125	2.41	0.95	317	2.25	1.04
Latino Students	115	2.47	0.84	148	2.43	0.87	263	2.44	0.86
Non-Target Students	104	2.54	0.81	94	2.41	0.88	198	2.48	0.85
Total	411	2.34	0.97	367	2.42	0.90	778	2.38	0.94

Note. n_{boys} = 348
M = 2.41
SD = .91
n_{girls} = 430
M = 2.35
SD = .96

Table N.6

SUMMARY OF TEACHER RESPONSES

n= 37

Show A

76 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 11 % mediocre 5 % no response 5%
good 78 % poor 0 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 38 %

38 % 3. I have previously taught the math content in this program to my class.
38 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 70 %

76 % 25. The teacher's guide has an adequate amount of information.
81 % 26. The format of the teacher's guide makes the information clear.
68 % 27. The suggestions for activities in the teacher's guide are good.
57 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 77 %

73 % 6. The pace of the program allowed students to absorb the material.
68 % 12. The order of the program was logical.
97 % 23. This program is humorous at times.
87 % 31. The music was effective.
62 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 87 %

92 % 14. The vocabulary was at a level that my class could understand.
81 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 74 %

78 % 29. The picture reception was adequate
70 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 93 %

89 % 13. The presentation held my students' attention.
97 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 82 %

89 % 1. I like the program.
87 % 2. The program was interesting for my students.
89 % 33. I would like to have more programs like this.
81 % 34. The program is helpful in presenting math activities to students.
57 % 35. The program makes it easier to discuss math with my students.
89 % 36. I would use more programs like this if they were available.

Table N.6 (continued)

MATH CONTENT SUBSCALE

TOTAL MEAN 62 %

62 % 7. The math topic was appropriate for my class.
70 % 8. The amount of information covered was appropriate for my class.
65 % 9. The program content was appropriate for my grade level.
68 % 10. The program content was appropriate for the math curriculum.
43 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE

TOTAL MEAN 84 %

76 % 16. The program would stimulate math activities with my students.
92 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE

TOTAL MEAN 73 %

84 % 18. This program presents ethnic groups in a positive manner.
89 % 19. This program presents sex roles in a positive manner.
76 % 20. This program presents social issues appropriate for my class.
60 % 21. This program presents conflict situations my class can understand.
57 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

3 % characters
24 % language
38 % voices
3 % dramatizations
19 % more visuals
11 % more action
5 % format variety
32 % math content
3 % affective content
0 % lower vocabulary
5 % music
14 % teacher's guide

73 % offered additional comments

Table N.7

SUMMARY OF CLASSROOM ACTIVITIES: SHOW A

18 classes (47%) did not participate in any classroom activity related to the program

12 classes (32%) participated in a related classroom activity BEFORE OR AFTER program viewing.

8 classes (21%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

38 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

16 classes (42 %) participated in a related classroom activity BEFORE program viewing.

In those 16 classes, the number and type of related classroom activities were:

2 activities
12 discussions
2 planned lessons
7 teacher dominated
0 student dominated
12 teacher-student interaction
9 preparation taken from program guide
1 preparation taken from teacher's own math curriculum
3 no math content preparation
2 other

AFTER VIEWING

12 classes (32%) participated in a related classroom activity AFTER program viewing.

In those 12 classes, the number and type of related classroom activities were:

5 activities
10 discussions
2 planned lessons
4 follow-up taken from program guide
9 teacher-student interaction
0 student dominated
4 teacher dominated
1 follow-up assignment made
0 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

20 classroom teachers (53 %) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 20 classroom teachers,

16 (80 %) dealt with the math content of the program.
1 (5 %) dealt with the cultural aspects of the program.
6 (30 %) dealt with the other attitudinal aspects of the program.

APPENDIX O'

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW B

STUDENT ATTENTION
STUDENT APPEAL
SHOW OVERALL
BROWNSTONE SEGMENTS
CITY FLATS
SCOOPS' PLACE
ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table 0.1

Student Attention: Show B

Part of Show	Students Attending and/or Responding	
	M	*SD*
Show Overall	95%	7%
Major Segments		
City Flats	96%	5%
Film Documentary	94%	9%
Historical Segment	86%	17%
Scoops' Place	94%	7%

Note. *n* = 38 classes.

Table 0.2

Student Appeal: Show B Overall

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	212	2.84	0.48	125	2.94	0.26	337	2.88	0.41
Latino Students	122	2.81	0.54	149	2.74	0.58	271	2.77	0.56
Non-Target Students	95	2.82	0.48	98	2.65	0.69	193	2.72	0.60
Total	429	2.83	0.49	372	2.78	0.56	801	2.81	0.52

Note. $n_{boys} = 367$
$M = 2.74$
$SD = .59$
$n_{girls} = 434$
$M = 2.87$
$SD = .45$

Table 0.3

Student Appeal: Brownstone Segments, Show B

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	208	2.75	0.58	124	2.94	0.26	332	2.82	0.49
Latino Students	118	2.71	0.63	141	2.60	0.75	259	2.65	0.70
Non-Target Students	95	2.66	0.66	97	2.55	0.72	192	2.60	0.69
Total	421	2.72	0.61	362	2.70	0.64	783	2.71	0.62

Note. $n_{boys} = 361$
$M = 2.65$
$SD = .68$
$n_{girls} = 422$
$M = 2.77$
$SD = .56$

Table 0.4

Student Appeal: City Flats, Show B

Group	Age Younger Students *n*	 *M*	 *SD*	 Older Students *n*	 *M*	 *SD*	 Total *n*	 *M*	 *SD*
Black Students	211	2.62	0.67	123	2.81	0.47	334	2.69	0.61
Latino Students	120	2.71	0.56	148	2.57	0.77	268	2.63	0.68
Non-Target Students	96	2.68	0.67	97	2.58	0.72	193	2.63	0.70
Total	427	2.66	0.64	368	2.65	0.67	795	2.66	0.66

Note. $n_{boys} = 368$
$M = 2.64$
$SD = .67$
$n_{girls} = 427$
$M = 2.67$
$SD = .65$

Table O.5

Student Appeal: Scoops' Place, Show B

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	207	2.65	0.71	123	2.80	0.50	330	2.71	0.64
Latino Students	120	2.53	0.78	146	2.66	0.67	266	2.61	0.72
Non-Target Students	96	2.66	0.68	96	2.53	0.72	192	2.59	0.70
Total	423	2.62	0.72	365	2.67	0.64	788	2.64	0.68

Note. n_{boys} = 359
M = 2.58
SD = .75
n_{girls} = 429
M = 2.70
SD = .62

Table 0.6

Student Appeal: Animation Segments, Show B

	Age								
	Younger Students			Older Students			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	205	2.82	0.53	120	2.85	0.51	325	2.83	0.52
Latino Students	118	2.72	0.61	146	2.67	0.67	264	2.69	0.64
Non-Target Students	92	2.70	0.66	88	2.67	0.68	180	2.68	0.67
Total	415	2.77	0.59	354	2.73	0.62	769	2.75	0.60

Note. n_{boys} = 349
M = 2.76
SD = .57
n_{girls} = 420
M = 2.74
SD = .63

Table 0.7

SUMMARY OF TEACHER RESPONSES

n= 37 Show B

84 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 19 % mediocre 3 % no response 2 %
good 73 % poor 3 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 51 %

62 % 3. I have previously taught the math content in this program to my class.
41 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 71 %

76 % 25. The teacher's guide has an adequate amount of information.
81 % 26. The format of the teacher's guide makes the information clear.
73 % 27. The suggestions for activities in the teacher's guide are good.
54 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 78 %

65 % 6. The pace of the program allowed students to absorb the material.
78 % 12. The order of the program was logical.
87 % 23. This program is humorous at times.
92 % 31. The music was effective.
70 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 85 %

81 % 14. The vocabulary was at a level that my class could understand.
89 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 76 %

84 % 29. The picture reception was adequate
68 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 92 %

87 % 13. The presentation held my students' attention.
97 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 84 %

89 % 1. I like the program.
92 % 2. The program was interesting for my students.
78 % 33. I would like to have more programs like this.
89 % 34. The program is helpful in presenting math activities to students.
73 % 35. The program makes it easier to discuss math with my students.
81 % 36. I would use more programs like this if they were available.

Table 0.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 85 %

95 % 7. The math topic was appropriate for my class.
76 % 8. The amount of information covered was appropriate for my class.
84 % 9. The program content was appropriate for my grade level.
97 % 10. The program content was appropriate for the math curriculum.
76 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 87 %

78 % 16. The program would stimulate math activities with my students.
95 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE TOTAL MEAN 75 %

92 % 18. This program presents ethnic groups in a positive manner.
81 % 19. This program presents sex roles in a positive manner.
73 % 20. This program presents social issues appropriate for my class.
62 % 21. This program presents conflict situations my class can understand.
68 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

5 % characters
11 % language
35 % voices
0 % dramatizations
27 % more visuals
14 % more action
8 % format variety
27 % math content
5 % affective content
0 % lower vocabulary
0 % music
24 % teacher's guide

81 % offered additional comments

Table 0.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW B

17 classes (45%) did not participate in any classroom activity related to the program

11 classes (29%) participated in a related classroom activity BEFORE OR AFTER program viewing.

10 classes (26%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

38 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

15 classes (40%) participated in a related classroom activity BEFORE program viewing.

In those 15 classes, the number and type of related classroom activities were:

3 activities
15 discussions
4 planned lessons
8 teacher dominated
0 student dominated
7 teacher-student interaction

10 preparation taken from program guide
2 preparation taken from teacher's own math curriculum
1 no math content preparation
0 other

AFTER VIEWING

16 classes (42%) participated in a related classroom activity AFTER program viewing.

In those 16 classes, the number and type of related classroom activities were:

4 activities
14 discussions
5 planned lessons
7 follow-up taken from program guide

11 teacher-student interaction
0 student dominated
6 teacher dominated
2 follow-up assignment made
1 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

21 classroom teachers (55%) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 21 classroom teachers,

18 (86%) dealt with the math content of the program.
4 (19%) dealt with the cultural aspects of the program.
5 (24%) dealt with the other attitudinal aspects of the program.

APPENDIX P

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW C

STUDENT ATTENTION
STUDENT APPEAL
  SHOW OVERALL
  BROWNSTONE SEGMENTS
  CITY FLATS
  SCOOPS' PLACE
  ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table P.1

Student Attention: Show C

Part of Show	Students Attending and/or Responding M	 SD
Show Overall	89%	20%
Major Segments		
Math in the Street #1	88%	20%
Scoops' Place	96%	8%
Film Documentary	73%	38%
City Flats	89%	21%
Math in the Street #2	72%	41%
Historical Segment	81%	30%

Note. *n* = 37 classes.

Table P.2

Student Appeal: Show C Overall

	Age								
	Younger Students			Older Students			Total		
Group	_n_	_M_	_SD_	_n_	_M_	_SD_	_n_	_M_	_SD_
Black Students	211	2.64	0.71	134	2.79	0.54	345	2.70	0.65
Latino Students	117	2.69	0.61	146	2.62	0.75	263	2.65	0.69
Non-Target Students	108	2.61	0.72	104	2.53	0.71	212	2.57	0.72
Total	436	2.65	0.69	384	2.65	0.68	820	2.65	0.68

Note. n_{boys} = 369
M = 2.66
SD = .67
n_{girls} = 451
M = 2.64
SD = .69

Table P.3

Student Appeal: Brownstone Segments, Show C

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	209	2.65	0.75	131	2.83	0.47	340	2.72	0.66
Latino Students	112	2.68	0.71	143	2.67	0.67	255	2.67	0.69
Non-Target Students	103	2.61	0.69	106	2.47	0.82	209	2.54	0.76
Total	424	2.65	0.73	380	2.67	0.67	804	2.66	0.70

Note. n_{boys} = 364
M = 2.61
SD = .73
n_{girls} = 440
M = 2.70
SD = .67

Table P.4

Student Appeal: City Flats, Show C

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	211	2.57	0.79	134	2.69	0.65	345	2.62	0.74
Latino Students	117	2.71	0.66	142	2.59	0.73	259	2.64	0.70
Non-Target Students	107	2.48	0.89	104	2.47	0.80	211	2.47	0.85
Total	435	2.58	0.79	380	2.60	0.73	815	2.59	0.76

Note. n_{boys} = 367
M = 2.59
SD = .75
n_{girls} = 448
M = 2.58
SD = .77

Table P.5

Student Appeal: Scoops' Place, Show C

	Age								
	Younger Students			Older Students			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	213	2.73	0.61	134	2.81	0.46	347	2.76	0.56
Latino Students	116	2.68	0.65	143	2.68	0.71	259	2.68	0.68
Non-Target Students	106	2.75	0.61	104	2.56	0.80	210	2.66	0.72
Total	435	2.72	0.62	381	2.69	0.67	816	2.71	0.64

Note. n_{boys} = 370.
M = 2.72
SD = .63
n_{girls} = 446
M = 2.70
SD = .66

Table P.6

Student Appeal: Animation Segments, Show C

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	209	2.66	0.76	130	2.84	0.46	339	2.73	0.67
Latino Students	117	2.68	0.67	141	2.69	0.67	258	2.68	0.67
Non-Target Students	107	2.62	0.75	99	2.71	0.66	206	2.66	0.71
Total	433	2.65	0.73	370	2.75	0.60	803	2.70	0.68

Note. n_{boys} = 358
M = 2.66
SD = .71
n_{girls} = 445
M = 2.72
SD = .65

Table P.7

SUMMARY OF TEACHER RESPONSES

n= 38 Show C

63 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 18 % mediocre 18% no response 8 %
good 48 % poor 8%

CLASS PREPARATION SUBSCALE TOTAL MEAN: 28 %

11 % 3. I have previously taught the math content in this program to my class.
45 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 57 %

58 % 25. The teacher's guide has an adequate amount of information.
63 % 26. The format of the teacher's guide makes the information clear.
58 % 27. The suggestions for activities in the teacher's guide are good.
47 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 67 %

55 % 6. The pace of the program allowed students to absorb the material.
47 % 12. The order of the program was logical.
95 % 23. This program is humorous at times.
82 % 31. The music was effective.
55 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 72 %

76 % 14. The vocabulary was at a level that my class could understand.
68 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 59 %

58 % 29. The picture reception was adequate
61 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 75 %

58 % 13. The presentation held my students' attention.
92 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 64 %

68 % 1. I like the program.
68 % 2. The program was interesting for my students.
58 % 33. I would like to have more programs like this.
71 % 34. The program is helpful in presenting math activities to students.
58 % 35. The program makes it easier to discuss math with my students.
58 % 36. I would use more programs like this if they were available.

Table P.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 66 %

82 % 7. The math topic was appropriate for my class.
61 % 8. The amount of information covered was appropriate for my class.
66 % 9. The program content was appropriate for my grade level.
82 % 10. The program content was appropriate for the math curriculum.
40 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 74 %

68 % 16. The program would stimulate math activities with my students.
79 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE TOTAL MEAN 58 %

71 % 18. This program presents ethnic groups in a positive manner.
74 % 19. This program presents sex roles in a positive manner.
45 % 20. This program presents social issues appropriate for my class.
53 % 21. This program presents conflict situations my class can understand.
50 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

13 % characters
29 % language
34 % voices
3 % dramatizations
24 % more visuals
18 % more action
3 % format variety
32 % math content
16 % affective content
5 % lower vocabulary
5 % music
8 % teacher's guide

74 % offered additional comments

Table P.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW C

19 classes (53%) did not participate in any classroom activity related to the program

10 classes (28%) participated in a related classroom activity BEFORE OR AFTER program viewing.

7 classes (19%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

36 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

13 classes (36%) participated in a related classroom activity BEFORE program viewing.

In those 13 classes, the number and type of related classroom activities were:

- 2 activities
- 13 discussions
- 3 planned lessons
- 6 teacher dominated
- 1 student dominated
- 9 teacher-student interaction
- 7 preparation taken from program guide
- 2 preparation taken from teacher's own math curriculum
- 3 no math content preparation
- 2 other

AFTER VIEWING

11 classes (31%) participated in a related classroom activity AFTER program viewing.

In those 11 classes, the number and type of related classroom activities were:

- 3 activities
- 10 discussions
- 5 planned lessons
- 3 follow-up taken from program guide
- 6 teacher-student interaction
- 0 student dominated
- 6 teacher dominated
- 1 follow-up assignment made
- 2 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

17 classroom teachers (47%) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 17 classroom teachers,

16 (94%) dealt with the math content of the program.

0 (0%) dealt with the cultural aspects of the program.

3 (18%) dealt with the other attitudinal aspects of the program.

APPENDIX Q

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW D

STUDENT ATTENTION
STUDENT APPEAL
  SHOW OVERALL
  BROWNSTONE SEGMENTS
  CITY FLATS
  SCOOPS' PLACE
  ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table Q.1

Student Attention: Show D

Part of Show	Students Attending and/or Responding	
	M	SD
Show Overall	91%	14%
Major Segments		
City Flats	92%	13%
Historical Segment	82%	31%
Scoops' Place	86%	17%
Film Documentary	92%	15%

Note. *n* = 35 classes.

Table Q.2

Student Appeal: Show D Overall

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	214	2.79	0.54	129	2.83	0.45	343	2.80	0.51
Latino Students	122	2.77	0.51	162	2.67	0.68	284	2.71	0.61
Non-Target Students	104	2.64	0.70	103	2.51	0.78	207	2.58	0.74
Total	440	2.75	0.57	394	2.68	0.65	834	2.72	0.61

Note. n_{boys} = 377
M = 2.66
SD = .69
n_{girls} = 457
M = 2.76
SD = .54

Table Q.3

Student Appeal: Brownstone Segments Show D

	Age								
	Younger Students			Older Students			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	207	2.74	0.59	130	2.74	0.62	337	2.74	0.60
Latino Students	120	2.68	0.62	160	2.66	0.71	280	2.67	0.67
Non-Target Students	102	2.59	0.80	102	2.47	0.80	204	2.53	0.80
Total	429	2.69	0.66	392	2.64	0.71	821	2.66	0.68

Note. n_{boys} = 367
M = 2.61
SD = .74
n_{girls} = 454
M = 2.70
SD = .63

Table Q.4

Student Appeal: City Flats, Show D

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	209	2.62	0.62	131	2.74	0.58	340	2.67	0.61
Latino Students	118	2.56	0.66	159	2.67	0.62	277	2.62	0.64
Non-Target Students	102	2.65	0.70	102	2.50	0.74	204	2.57	0.72
Total	429	2.61	0.65	392	2.65	0.65	821	2.63	0.65

Note. n_{boys} = 371
M = 2.62
SD = .66
n_{girls} = 450
M = 2.64
SD = .64

Table Q.5

Student Appeal: Scoops' Place, Show D

	Age								
	Younger Students			Older Students			Total		
Group	$\underline{n}$	$\underline{M}$	$\underline{SD}$	$\underline{n}$	$\underline{M}$	$\underline{SD}$	$\underline{n}$	$\underline{M}$	$\underline{SD}$
Black Students	208	2.66	0.70	131	2.79	0.53	339	2.71	0.64
Latino Students	116	2.67	0.67	160	2.61	0.72	276	2.64	0.70
Non-Target Students	101	2.58	0.80	104	2.43	0.87	205	2.51	0.84
Total	425	2.64	0.72	395	2.62	0.72	820	2.63	0.72

Note. $\underline{n}_{boys} = 369$
$\underline{M} = 2.59$
$\underline{SD} = .77$
$\underline{n}_{girls} = 451$
$\underline{M} = 2.67$
$\underline{SD} = .67$

Table Q.6

Student Appeal: Animation Segments, Show D

	Age								
	Younger Students			Older Students			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	206	2.71	0.66	129	2.84	0.50	335	2.76	0.61
Latino Students	120	2.71	0.60	159	2.74	0.60	279	2.72	0.60
Non-Target Students	100	2.69	0.68	102	2.64	0.69	202	2.66	0.68
Total	426	2.71	0.65	390	2.74	0.60	816	2.72	0.62

Note. n_{boys} = 368
M = 2.70
SD = .63
n_{girls} = 448
M = 2.75
SD = .61

Table Q.7

SUMMARY OF TEACHER RESPONSES

n= 37 Show D

60 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 27 % mediocre 27 % no response 3 %
good 43 % poor 0 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 43 %

38 % 3. I have previously taught the math content in this program to my class.
49 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 72 %

81 % 25. The teacher's guide has an adequate amount of information.
78 % 26. The format of the teacher's guide makes the information clear.
81 % 27. The suggestions for activities in the teacher's guide are good.
49 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 77 %

62 % 6. The pace of the program allowed students to absorb the material.
73 % 12. The order of the program was logical.
87 % 23. This program is humorous at times.
97 % 31. The music was effective.
65 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 85 %

92 % 14. The vocabulary was at a level that my class could understand.
78 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 81 %

78 % 29. The picture reception was adequate
84 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 73 %

62 % 13. The presentation held my students' attention.
16 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 71 %

73 % 1. I like the program.
78 % 2. The program was interesting for my students.
70 % 33. I would like to have more programs like this.
76 % 34. The program is helpful in presenting math activities to students.
62 % 35. The program makes it easier to discuss math with my students.
65 % 36. I would use more programs like this if they were available.

Table Q.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 65 %

81 % 7. The math topic was appropriate for my class.
54 % 8. The amount of information covered was appropriate for my class.
78 % 9. The program content was appropriate for my grade level.
65 % 10. The program content was appropriate for the math curriculum.
49 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 81 %

78 % 16. The program would stimulate math activities with my students.
84 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE TOTAL MEAN 69 %

78 % 18. This program presents ethnic groups in a positive manner.
81 % 19. This program presents sex roles in a positive manner.
51 % 20. This program presents social issues appropriate for my class.
65 % 21. This program presents conflict situations my class can understand.
68 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

3 % characters
22 % language
22 % voices
11 % dramatizations
22 % more visuals
22 % more action
3 % format variety
24 % math content
0 % affective content
3 % lower vocabulary
3 % music
5 % teacher's guide

65 % offered additional comments

Table Q.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW D

17 classes (46%) did not participate in any classroom activity related to the program

12 classes (32%) participated in a related classroom activity BEFORE OR AFTER program viewing.

8 classes (22%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

37 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

16 classes (43%) participated in a related classroom activity BEFORE program viewing.

In those 16 classes, the number and type of related classroom activities were:

1 activities
14 discussions
1 planned lessons
9 teacher dominated
0 student dominated
12 teacher-student interaction

9 preparation taken from program guide
3 preparation taken from teacher's own math curriculum
1 no math content preparation
0 other

AFTER VIEWING

12 classes (32%) participated in a related classroom activity AFTER program viewing.

In those 12 classes, the number and type of related classroom activities were:

3 activities
8 discussions
2 planned lessons
1 follow-up taken from program guide

9 teacher-student interaction
1 student dominated
2 teacher dominated
2 follow-up assignment made
2 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

20 classroom teachers (54%) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 20 classroom teachers,

15 (75 %) dealt with the math content of the program.
1 (5 %) dealt with the cultural aspects of the program.
2 (10 %) dealt with the other attitudinal aspects of the program.

APPENDIX R

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW E

STUDENT ATTENTION
STUDENT APPEAL
  SHOW OVERALL
  BROWNSTONE SEGMENTS
  CITY FLATS
  SCOOPS' PLACE
  ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table R.1

Student Attention: Show E

Part of Show	Students Attending and/or Responding	
	M	SD
Show Overall	91%	15%
Major Segments		
Math Fact #1	96%	5%
Scoops' Place	94%	10%
Math Fact #2	97%	5%
Math Fact #3	85%	25%
Historical Segment	79%	26%
City Flats	89%	15%
Math Fact #4	71%	41%

Note. n = 33 classes.

Table R.2

Student Appeal: Show E Overall

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	165	2.64	0.73	108	2.64	0.65	273	2.64	0.70
Latino Students	119	2.52	0.84	142	2.63	0.70	261	2.58	0.77
Non-Target Students	101	2.62	0.69	89	2.56	0.77	190	2.59	0.73
Total	385	2.60	0.76	339	2.62	0.70	724	2.61	0.73

Note. n_{boys} = 343
M = 2.56
SD = .75
n_{girls} = 381
M = 2.65
SD = .71

Table R.3

Student Appeal: Brownstone Segments, Show E

	Age						Total		
	Younger Students			Older Students					
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	162	2.59	0.80	108	2.69	0.62	270	2.63	0.73
Latino Students	118	2.47	0.86	142	2.61	0.74	260	2.55	0.80
Non-Target Students	102	2.54	0.80	90	2.37	0.88	192	2.46	0.84
Total	382	2.54	0.82	340	2.57	0.75	722	2.56	0.79

Note. $n_{boys} = 339$
$M = 2.52$
$SD = .79$
$n_{girls} = 383$
$M = 2.59$
$SD = .79$

Table R.4

Student Appeal: City Flats, Show E

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	165	2.62	0.74	107	2.76	0.58	272	2.67	0.69
Latino Students	117	2.53	0.76	138	2.67	0.66	255	2.61	0.71
Non-Target Students	103	2.73	0.60	87	2.44	0.80	190	2.59	0.70
Total	385	2.62	0.72	332	2.64	0.69	717	2.63	0.70

Note. n_{boys} = 336
M = 2.65
SD = .65
n_{girls} = 381
M = 2.61
SD = .75

Table R.5

Student Appeal: Scoops' Place, Show E

	Age								
	Younger Students			Older Students			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	163	2.58	0.76	110	2.75	0.55	273	2.64	0.69
Latino Students	113	2.42	0.86	140	2.64	0.68	253	2.54	0.77
Non-Target Students	104	2.49	0.79	87	2.55	0.83	191	2.52	0.81
Total	380	2.51	0.80	337	2.65	0.69	717	2.57	0.75

Note. n_{boys} = 344
M = 2.53
SD = .76
n_{girls} = 373
M = 2.61
SD = .74

Table R.6

Student Appeal: Animation Segments, Show E

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	160	2.66	0.74	109	2.80	0.56	269	2.72	0.68
Latino Students	119	2.57	0.75	140	2.76	0.62	259	2.67	0.69
Non-Target Students	102	2.74	0.64	90	2.61	0.77	192	2.68	0.71
Total	381	2.65	0.72	339	2.73	0.65	720	2.69	0.69

Note. n_{boys} = 340
M = 2.70
SD = .69
n_{girls} = 380
M = 2.68
SD = .69

Table R.7

SUMMARY OF TEACHER RESPONSES

n= 35 Show E

80 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 26 % mediocre 3 % no response 2 %
good 69 % poor 0 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 36 %

34 % 3. I have previously taught the math content in this program to my class.
37 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 69 %

71 % 25. The teacher's guide has an adequate amount of information.
77 % 26. The format of the teacher's guide makes the information clear.
80 % 27. The suggestions for activities in the teacher's guide are good.
49 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 81 %

80 % 6. The pace of the program allowed students to absorb the material.
74 % 12. The order of the program was logical.
91 % 23. This program is humorous at times.
89 % 31. The music was effective.
71 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 89 %

94 % 14. The vocabulary was at a level that my class could understand.
83 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 81 %

80 % 29. The picture reception was adequate
83 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 90 %

83 % 13. The presentation held my students' attention.
97 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 81 %

91 % 1. I like the program.
89 % 2. The program was interesting for my students.
80 % 33. I would like to have more programs like this.
83 % 34. The program is helpful in presenting math activities to students.
71 % 35. The program makes it easier to discuss math with my students.
74 % 36. I would use more programs like this if they were available.

Table R.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 81 %

91 % 7. The math topic was appropriate for my class.
77 % 8. The amount of information covered was appropriate for my class.
83 % 9. The program content was appropriate for my grade level.
83 % 10. The program content was appropriate for the math curriculum.
71 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 81 %

74 % 16. The program would stimulate math activities with my students.
89 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE TOTAL MEAN 82 %

86 % 18. This program presents ethnic groups in a positive manner.
89 % 19. This program presents sex roles in a positive manner.
77 % 20. This program presents social issues appropriate for my class.
80 % 21. This program presents conflict situations my class can understand.
80 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

3 % characters
11 % language
20 % voices
6 % dramatizations
20 % more visuals
6 % more action
0 % format variety
17 % math content
6 % affective content
0 % lower vocabulary
0 % music
11 % teacher's guide

63 % offered additional comments

Table R.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW E

19 classes (56%) did not participate in any classroom activity related to the program

11 classes (32%) participated in a related classroom activity BEFORE OR AFTER program viewing.

4 classes (12%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

34 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

10 classes (29%) participated in a related classroom activity BEFORE program viewing.

In those 10 classes, the number and type of related classroom activities were:

3 activities
8 discussions
1 planned lessons
5 teacher dominated
0 student dominated
7 teacher-student interaction

6 preparation taken from program guide
2 preparation taken from teacher's own math curriculum
2 no math content preparation
0 other

AFTER VIEWING

9 classes (27%) participated in a related classroom activity AFTER program viewing.

In those 9 classes, the number and type of related classroom activities were:

6 activities
4 discussions
3 planned lessons
4 follow-up taken from program guide

6 teacher-student interaction
2 student dominated
3 teacher dominated
4 follow-up assignment made
1 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

15 classroom teachers (44%) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 15 classroom teachers,

13 (87%) dealt with the math content of the program.
2 (13%) dealt with the cultural aspects of the program.
2 (13%) dealt with the other attitudinal aspects of the program.

APPENDIX S

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW F

STUDENT ATTENTION
STUDENT APPEAL
- SHOW OVERALL
- BROWNSTONE SEGMENTS
- CITY FLATS
- SCOOPS' PLACE
- ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table S.1

Student Attention: Show F

Part of Show	Students Attending and/or Responding	
	M	SD
Show Overall	90%	14%
Major Segments		
Math in the Street #1	90%	12%
City Flats	96%	4%
Math in the Street #2	89%	16%
Scoops' Place	89%	14%
Historical Segment	82%	26%
Film Documentary	84%	21%

Note. n = 29 classes.

Table S.2

Student Appeal: Show F Overall

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	201	2.74	0.62	120	2.81	0.52	321	2.77	0.58
Latino Students	120	2.83	0.48	150	2.59	0.76	270	2.70	0.66
Non-Target Students	88	2.65	0.66	103	2.66	0.63	191	2.65	0.65
Total	409	2.75	0.59	373	2.68	0.66	782	2.71	0.63

Note. n_{boys} = 354
M = 2.68
SD = .65
n_{girls} = 428
M = 2.74
SD = .60

Table S.3

Student Appeal: Brownstone Segments, Show F

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	194	2.69	0.69	120	2.73	0.64	314	2.70	0.67
Latino Students	116	2.85	0.42	148	2.48	0.81	264	2.64	0.69
Non-Target Students	89	2.55	0.80	103	2.50	0.79	192	2.52	0.79
Total	399	2.70	0.66	371	2.57	0.76	770	2.64	0.71

Note. n_{boys} = 346
M = 2.56
SD = .76
n_{girls} = 424
M = 2.70
SD = .66

Table S.4

Student Appeal: City Flats, Show F

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	200	2.64	0.71	118	2.70	0.59	318	2.68	0.67
Latino Students	119	2.78	0.55	149	2.61	0.76	268	2.69	0.69
Non-Target Students	90	2.68	0.63	101	2.61	0.69	191	2.64	0.66
Total	409	2.69	0.65	368	2.66	0.69	777	2.67	0.67

Note. n_{boys} = 354
M = 2.62
SD = .72
n_{girls} = 423
M = 2.72
SD = .63

Table S.5

Student Appeal: Scoops' Place, Show F

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	198	2.63	0.69	118	2.81	0.56	316	2.69	0.65
Latino Students	118	2.77	0.56	149	2.52	0.83	267	2.63	0.73
Non-Target Students	86	2.59	0.74	102	2.58	0.79	188	2.59	0.77
Total	402	2.66	0.67	369	2.63	0.75	771	2.64	0.71

Note. $n_{boys} = 349$
$M = 2.59$
$SD = .76$
$n_{girls} = 422$
$M = 2.69$
$SD = .66$

Table S.6

Student Appeal: Animation Segments, Show F

Group	Age								
	Younger Students			Older Students			Total		
	n	M	SD	n	M	SD	n	M	SD
Black Students	193	2.70	0.68	121	2.82	0.53	314	2.75	0.63
Latino Students	120	2.88	0.41	150	2.75	0.60	270	2.81	0.53
Non-Target Students	88	2.74	0.65	102	2.74	0.67	190	2.74	0.66
Total	401	2.77	0.61	373	2.77	0.60	774	2.77	0.60

Note. n_{boys} = 350
M = 2.76
SD = .60
n_{girls} = 424
M = 2.77
SD = .61

Table S.7

SUMMARY OF TEACHER RESPONSES

n= 35 Show F

74 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 31 % mediocre 20 % no response ___ %
good 46 % poor 03 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 47 %

51 % 3. I have previously taught the math content in this program to my class.
43 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 60 %

60 % 25. The teacher's guide has an adequate amount of information.
69 % 26. The format of the teacher's guide makes the information clear.
60 % 27. The suggestions for activities in the teacher's guide are good.
51 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 82 %

86 % 6. The pace of the program allowed students to absorb the material.
80 % 12. The order of the program was logical.
86 % 23. This program is humorous at times.
91 % 31. The music was effective.
66 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 90 %

91 % 14. The vocabulary was at a level that my class could understand.
89 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 76 %

69 % 29. The picture reception was adequate
83 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 93 %

89 % 13. The presentation held my students' attention.
97 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 79 %

86 % 1. I like the program.
80 % 2. The program was interesting for my students.
71 % 33. I would like to have more programs like this.
89 % 34. The program is helpful in presenting math activities to students.
71 % 35. The program makes it easier to discuss math with my students.
77 % 36. I would use more programs like this if they were available.

Table S.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 73 %

71 % 7. The math topic was appropriate for my class.
74 % 8. The amount of information covered was appropriate for my class.
80 % 9. The program content was appropriate for my grade level.
80 % 10. The program content was appropriate for the math curriculum.
60 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 77 %

69 % 16. The program would stimulate math activities with my students.
86 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE TOTAL MEAN 67 %

77 % 18. This program presents ethnic groups in a positive manner.
71 % 19. This program presents sex roles in a positive manner.
54 % 20. This program presents social issues appropriate for my class.
69 % 21. This program presents conflict situations my class can understand.
66 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

11 % characters
11 % language
17 % voices
11 % dramatizations
14 % more visuals
3 % more action
7 % format variety
26 % math content
0% affective content
0% lower vocabulary
3% music
17% teacher's guide

71 % offered additional comments

Table S.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW F

23 classes (64%) did not participate in any classroom activity related to the program

8 classes (22%) participated in a related classroom activity BEFORE OR AFTER program viewing.

5 classes (14%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

36 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

7 classes (19%) participated in a related classroom activity BEFORE program viewing.

In those 7 classes, the number and type of related classroom activities were:

1 activities
7 discussions
1 planned lessons
4 teacher dominated
0 student dominated
7 teacher-student interaction

7 preparation taken from program guide
0 preparation taken from teacher's own math curriculum
0 no math content preparation
0 other

AFTER VIEWING

11 classes (31%) participated in a related classroom activity AFTER program viewing.

In those 11 classes, the number and type of related classroom activities were:

2 activities
9 discussions
2 planned lessons
[illegible] follow-up taken [illegible] program guide

8 teacher-student interaction
0 student dominated
6 teacher dominated
1 follow-up assignment made
2 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

13 classroom teachers (36 %) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 13 classroom teachers,

12 (92%) dealt with the math content of the program.
1 (8%) dealt with the cultural aspects of the program.
0 (0%) dealt with the other attitudinal aspects of the program.

APPENDIX T

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW G

STUDENT ATTENTION
STUDENT APPEAL
  SHOW OVERALL
  BROWNSTONE SEGMENTS
  CITY FLATS
  SCOOPS' PLACE
  ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table T.1

Student Attention: Show G

	Students Attending and/or Responding	
Part of Show	M	SD
Show Overall	89%	16%
Major Segments		
Math in the Street #1	89%	14%
Math Fact #1	91%	13%
Scoops' Place	87%	17%
Math Fact #2	86%	18%
Math in the Street #2	84%	21%
Historical Segment	74%	32%
Math Fact #3	82%	26%
City Flats	94%	7%
Math Fact #4	74%	37%

Note. n = 38 classes.

Table T.2

Student Appeal: Show G Overall

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	213	2.61	0.73	131	2.63	0.73	344	2.61	0.73
Latino Students	109	2.62	0.68	129	2.50	0.82	238	2.56	0.76
Non-Target Students	101	2.50	0.81	101	2.26	0.89	202	2.38	0.86
Total	423	2.59	0.74	361	2.48	0.82	784	2.54	0.78

Note. n_{boys} = 357
M = 2.46
SD = .86
n_{girls} = 427
M = 2.60
SD = .70

Table T.3

Student Appeal: Brownstone Segments, Show G

	Age								
	Younger Students			Older Students			Total		
Group	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	205	2.50	0.83	132	2.64	0.73	337	2.56	0.80
Latino Students	108	2.47	0.85	132	2.40	0.87	240	2.43	0.86
Non-Target Students	100	2.49	0.85	101	2.16	0.99	201	2.32	0.94
Total	413	2.49	0.84	365	2.42	0.88	778	2.46	0.86

Note. n_{boys} = 357
M = 2.36
SD = .92
n_{girls} = 421
M = 2.54
SD = .80

Table T.4

Student Appeal: City Flats, Show G

Group	Age								
	Younger Students			Older Students			Total		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	202	2.53	0.81	133	2.61	0.75	335	2.56	0.79
Latino Students	106	2.67	0.73	128	2.56	0.76	234	2.61	0.75
Non-Target Students	101	2.63	0.72	102	2.35	0.92	203	2.49	0.83
Total	409	2.59	0.77	363	2.52	0.81	772	2.56	0.79

Note. n_{boys} = 356
M = 2.51
SD = .84
n_{girls} = 416
M = 2.60
SD = .74

Table T.5

Student Appeal: Scoops' Place, Show G

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	212	2.57	0.79	133	2.75	0.62	345	2.64	0.73
Latino Students	104	2.47	0.89	129	2.51	0.91	233	2.49	0.85
Non-Target Students	99	2.48	0.88	102	2.25	0.95	201	2.37	0.92
Total	415	2.52	0.84	364	2.53	0.81	779	2.53	0.83

Note. n_{boys} = 359
M = 2.45
SD = .90
n_{girls} = 420
M = 2.59
SD = .75

Table T.6

Student Appeal: Animation Segments, Show G

Group	Age								
	Younger Students			Older Students			Total		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	204	2.57	0.80	130	2.65	0.78	334	2.60	0.79
Latino Students	106	2.64	0.73	126	2.63	0.72	232	2.63	0.73
Non-Target Students	99	2.66	0.67	99	2.48	0.86	198	2.57	0.78
Total	409	2.61	0.75	355	2.59	0.78	764	2.60	0.77

Note. $n_{boys} = 352$
$M = 2.56$
$SD = .82$
$n_{girls} = 412$
$M = 2.64$
$SD = .72$

Table T.7

SUMMARY OF TEACHER RESPONSES

n= 36 Show G

67 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 8 % mediocre 22 % no response 6 %
good 56 % poor 8 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 33 %

33 % 3. I have previously taught the math content in this program to my class.
33 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 62 %

64 % 25. The teacher's guide has an adequate amount of information.
67 % 26. The format of the teacher's guide makes the information clear.
64 % 27. The suggestions for activities in the teacher's guide are good.
53 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 74 %

75 % 6. The pace of the program allowed students to absorb the material.
69 % 12. The order of the program was logical.
86 % 23. This program is humorous at times.
86 % 31. The music was effective.
53 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 88 %

89 % 14. The vocabulary was at a level that my class could understand.
86 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 81 %

81 % 29. The picture reception was adequate
81 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 78 %

67 % 13. The presentation held my students' attention.
89 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 76 %

83 % 1. I like the program.
75 % 2. The program was interesting for my students.
81 % 33. I would like to have more programs like this.
78 % 34. The program is helpful in presenting math activities to students.
67 % 35. The program makes it easier to discuss math with my students.
75 % 36. I would use more programs like this if they were available.

Table T.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 75 %

81 % 7. The math topic was appropriate for my class.
72 % 8. The amount of information covered was appropriate for my class.
78 % 9. The program content was appropriate for my grade level.
86 % 10. The program content was appropriate for the math curriculum.
58 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 81 %

81 % 16. The program would stimulate math activities with my students.
81 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDES SUBSCALE TOTAL MEAN 73 %

89 % 18. This program presents ethnic groups in a positive manner.
78 % 19. This program presents sex roles in a positive manner.
61 % 20. This program presents social issues appropriate for my class.
69 % 21. This program presents conflict situations my class can understand.
69 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

8 % characters
17 % language
25 % voices
19 % dramatizations
28 % more visuals
17 % more action
11 % format variety
25 % math content
3 % affective content
7 % lower vocabulary
6 % music
17 % teacher's guide

67 % offered additional comments

Table T.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW G

22 classes (60%) did not participate in any classroom activity related to the program

9 classes (24%) participated in a related classroom activity BEFORE OR AFTER program viewing.

6 classes (16%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

37 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

11 classes (30%) participated in a related classroom activity BEFORE program viewing.

In those 11 classes, the number and type of related classroom activities were:

2 activities
9 discussions
2 planned lessons
7 teacher dominated
0 student dominated
4 teacher-student interaction

8 preparation taken from program guide
2 preparation taken from teacher's own math curriculum
1 no math content preparation
0 other

AFTER VIEWING

10 classes (27%) participated in a related classroom activity AFTER program viewing.

In those 10 classes, the number and type of related classroom activities were:

4 activities
5 discussions
2 planned lessons
6 follow-up taken from program guide

5 teacher-student interaction
1 student dominated
2 teacher dominated
0 follow-up assignment made
3 other

CONTENT OF RELATED CLASSROOM ACTIVITIES

15 classroom teachers (40%) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 15 classroom teachers,

13 (87 %) dealt with the math content of the program.
1 (7 %) dealt with the cultural aspects of the program.
0 (0 %) dealt with the other attitudinal aspects of the program.

APPENDIX U

DESCRIPTIVE STATISTICS, SHOW-BY-SHOW ANALYSIS:
SHOW H

STUDENT ATTENTION
STUDENT APPEAL
- SHOW OVERALL
- BROWNSTONE SEGMENTS
- CITY FLATS
- SCOOPS' PLACE
- ANIMATION SEGMENTS

TEACHER RESPONSES
RELATED CLASSROOM ACTIVITIES

Table U.1

Student Attention: Show H

Part of Show	Students Attending and/or Responding	
	M	SD
Show Overall	92%	11%
Major Segments		
City Flats	96%	5%
Historical Segment	85%	19%
Scoops' Place	89%	14%
Film Documentary	91%	16%

Note. n = 38 classes.

Table U.2

Student Appeal: Show H Overall

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	213	2.61	0.75	130	2.65	0.69	343	2.62	0.73
Latino Students	130	2.65	0.81	142	2.46	0.82	272	2.55	0.82
Non-Target Students	99	2.65	0.69	103	2.55	0.78	202	2.60	0.73
Total	442	2.63	0.75	375	2.55	0.77	817	2.59	0.76

Note. $\underline{n}_{boys}$ = 377
$\underline{M}$ = 2.51
$\underline{SD}$ = .83
$\underline{n}_{girls}$ = 440
$\underline{M}$ = 2.66
$\underline{SD}$ = .69

Table U.3

Student Appeal: Brownstone Segments, Show H

	Age								
	Younger Students			Older Students			Total		
Group	n	M	SD	n	M	SD	n	M	SD
Black Students	207	2.61	0.77	129	2.57	0.77	336	2.60	0.77
Latino Students	129	2.52	0.82	139	2.34	0.92	268	2.43	0.88
Non-Target Students	98	2.56	0.83	104	2.23	0.99	202	2.39	0.93
Total	434	2.57	0.80	372	2.39	0.90	806	2.49	0.85

Note. n_{boys} = 374
M = 2.35
SD = .93
n_{girls} = 432
M = 2.60
SD = .76

Table U.4

Student Appeal: City Flats, Show H

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	204	2.58	0.77	127	2.65	0.67	331	2.61	0.73
Latino Students	132	2.69	0.63	140	2.69	0.66	272	2.69	0.64
Non-Target Students	96	2.67	0.66	104	2.61	0.76	200	2.64	0.71
Total	432	2.63	0.70	371	2.65	0.69	803	2.64	0.70

Note. n_{boys} = 369

M = 2.60

SD = .73

n_{girls} = 434

M = 2.68

SD = .67

Table U.5

Student Appeal: Scoops' Place, Show H

Group	Age						Total		
	Younger Students			Older Students					
	n	M	SD	n	M	SD	n	M	SD
Black Students	204	2.65	0.70	127	2.65	0.72	331	2.65	0.71
Latino Students	130	2.59	0.79	140	2.53	0.76	270	2.56	0.78
Non-Target Students	97	2.61	0.73	104	2.55	0.76	201	2.58	0.75
Total	431	2.62	0.74	351	2.57	0.75	802	2.60	0.74

Note. n_{boys} = 371
M = 2.54
SD = .79
n_{girls} = 431
M = 2.65
SD = .70

Table U.6

Student Appeal: Animation Segments, Show H

Group	Age						Total		
	Younger Students			Older Students					
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Black Students	208	2.65	0.75	129	2.67	0.68	337	2.66	0.72
Latino Students	129	2.66	0.72	140	2.58	0.77	269	2.62	0.75
Non-Target Students	99	2.63	0.78	102	2.60	0.76	201	2.61	0.77
Total	436	2.65	0.75	371	2.62	0.73	807	2.63	0.74

Note. n_{boys} = 369
M = 2.64
SD = .72
n_{girls} = 438
M = 2.63
SD = .76

Table U.7

SUMMARY OF TEACHER RESPONSES

n= 37 Show H

78 % 37. This program was educationally effective.
38. The overall presentation in this week's program was:

outstanding 30 % mediocre 8 % no response %
good 62 % poor 0 %

CLASS PREPARATION SUBSCALE TOTAL MEAN: 43 %

51 % 3. I have previously taught the math content in this program to my class.
35 % 4. I prepared students for the program.

PROGRAM GUIDE SUBSCALE TOTAL MEAN 53 %

57 % 25. The teacher's guide has an adequate amount of information.
57 % 26. The format of the teacher's guide makes the information clear.
62 % 27. The suggestions for activities in the teacher's guide are good.
38 % 28. I would use this guide continuously when using this program.

PROGRAM PRESENTATION SUBSCALE TOTAL MEAN 81 %

81 % 6. The pace of the program allowed students to absorb the material.
76 % 12. The order of the program was logical.
92 % 23. This program is humorous at times.
92 % 31. The music was effective.
65 % 32. This program has artistic quality

LANGUAGE SUBSCALE TOTAL MEAN 91 %

92 % 14. The vocabulary was at a level that my class could understand.
89 % 15. The language was appropriate within the context of the program.

TECHNICAL QUALITY SUBSCALE TOTAL MEAN 89 %

95 % 29. The picture reception was adequate
84 % 30. The sound was adequate.

STUDENT ATTENTION SUBSCALE TOTAL MEAN 85 %

76 % 13. The presentation held my students' attention.
95 % 24. The students were not difficult to control during the program. (Item Recoded)

PROGRAM APPEAL SUBSCALE TOTAL MEAN 81 %

89 % 1. I like the program.
84 % 2. The program was interesting for my students.
81 % 33. I would like to have more programs like this.
84 % 34. The program is helpful in presenting math activities to students.
65 % 35. The program makes it easier to discuss math with my students.
81 % 36. I would use more programs like this if they were available.

Table U.7 (continued)

MATH CONTENT SUBSCALE TOTAL MEAN 72 %

81 % 7. The math topic was appropriate for my class.
70 % 8. The amount of information covered was appropriate for my class.
70 % 9. The program content was appropriate for my grade level.
68 % 10. The program content was appropriate for the math curriculum.
70 % 11. This presentation met the needs of my students.

MATH ATTITUDE SUBSCALE TOTAL MEAN 80 %

76 % 16. The program would stimulate math activities with my students.
84 % 17. The program encourages positive attitudes towards math.

SOCIAL ATTITUDE SUBSCALE TOTAL MEAN 76 %

87 % 18. This program presents ethnic groups in a positive manner.
87 % 19. This program presents sex roles in a positive manner.
57 % 20. This program presents social issues appropriate for my class.
76 % 21. This program presents conflict situations my class can understand.
73 % 22. This program presents positive techniques for resolving conflict.

PROGRAM AREAS NEEDING IMPROVEMENT:

5 % characters
8 % language
14 % voices
5 % dramatizations
19 % more visuals
22 % more action
8 % format variety
22 % math content
3 % affective content
5 % lower vocabulary
3 % music
14 % teacher's guide

60 % offered additional comments

Table U.8

SUMMARY OF CLASSROOM ACTIVITIES: SHOW H

23 classes (61%) did not participate in any classroom activity related to the program

10 classes (26%) participated in a related classroom activity BEFORE OR AFTER program viewing.

5 classes (13%) participated in a related classroom activity BOTH BEFORE AND AFTER program viewing.

---

38 Total number of classes

NUMBER AND TYPE OF RELATED CLASSROOM ACTIVITIES

BEFORE VIEWING

9 classes (24%) participated in a related classroom activity BEFORE program viewing.

In those 9 classes, the number and type of related classroom activities were:

1	activities	7	preparation taken from program guide
9	discussions	2	preparation taken from teacher's own math curriculum
2	planned lessons	1	no math content preparation
4	teacher dominated	0	other
0	student dominated		
8	teacher-student interaction		

AFTER VIEWING

11 classes (29%) participated in a related classroom activity AFTER program viewing.

In those 11 classes, the number and type of related classroom activities were:

4	activities	6	teacher-student interaction
8	discussions	2	student dominated
2	planned lessons	3	teacher dominated
6	follow-up taken from program guide	1	follow-up assignment made
		3	other

CONTENT OF RELATED CLASSROOM ACTIVITIES

15 classroom teachers (39%) conducted a related activity and/or discussion BEFORE, AFTER, or BOTH BEFORE AND AFTER program viewing.

Of those 15 classroom teachers,

14 (93 %) dealt with the math content of the program.

0 (0 %) dealt with the cultural aspects of the program.

3 (20 %) dealt with the other attitudinal aspects of the program.

APPENDIX

V

Programs 101-120

INFINITY FACTORY

Program 101
Percentages

Helpful Materials

Meter stick – to show percentages

Main Math Ideas

Percentage as a way to express fractions

Equivalence between percentages and fractions

Before the Program

Some questions for students:

- What is one hundred percent of something?
- What is fifty percent of something?
- What does the word "percent" mean?

After the Program

(See back of sheet.)

Notes

Some Highlights

Brownstone: Danny talks 50 percent of the time.

Math-In-The-Street: "What percentage of the day do you spend talking?"

Animation: Percentages represent fractions of the whole.

City Flats: A candidate for the school board wins more than 50 percent of the total votes.

Math-In-The-Street: "What percent of your body is covered with clothes?"

Animation: Several examples show the meaning of one half.

Scoops' Place: Explaining how much money a boxer can make from a fight, Gregory cuts up a pie to show how percentages work.

Song

90% – probably.
50% – possibly.
10% – probably not.

So will we do it?
Yes, we'll do it.
We don't feel we will.
It depends on the percentage –
Percentage, percentage, yeah!

Other Suggestions

The next time there is a class election, have students report the result in percentages as well as in votes counted.

Explain and discuss the fact that some salespeople work on commission, usually expressed as a percentage of the money they bring in through sales. Does a low commission (in percent) always mean a low income?

People often use percents to talk about changes; for example: The number of children in a school went up ten percent last year. Does this say how many more children there are in the school? What information is missing?

- Why is it often convenient to talk about changes in percents?

After the Program

On a meter stick, point out that the centimeter marks divide it into 100 equal parts.

- Have a student find the point halfway along the meter stick by balancing the stick on his or her finger. What number is halfway along? What percentage of the meter stick is half the meter stick?
- Mark the 50 cm point, and have a student find half of the 50 cm interval by eye. What percentage is one-quarter of the meter stick? What percentage is three-quarters?
- Have a student divide the meter stick into three equal parts by eye. Roughly what percentage is one-third of the meter stick? Two-thirds?
- What percentage of the meter stick is 20 cm? 10 cm? 5 cm? One cm? (Note: Seeing these percentages marked off on the stick may help students visualize what the percentages mean.)
- What percentage of the meter stick is 80 cm? 90 cm? 95 cm? 99 cm? 100 cm?

Select ten students. Ask the class:

- What percentage of the ten have birthdays in the first half of the year? What percentage have birthdays in the second half of the year? Have students add the percentages. Do they total 100 percent?
- What percentage of the ten are wearing something red?
- What percentage of the ten are named John? (Pick one student's name.)
- What percentage are named Caroline? (Pick a name not in the class.)

Have ten students report how long they watched television last night.

- What percentage watched no television at all?
- What percentage watched one hour or more? Two hours or more? And so on.

Repeat some of these questions with *twenty* students.

Repeat some questions with *four* students, and some with *two* students.

If some students in the class are good at division:

- What percentage of the total class are girls? What percentage are boys? Have students add the percentages.
- What percentage of the total class watched at least two hours of television last night?

Tangents

Any percentage can be put as a fraction. (For example, 27 percent is the same as $\frac{27}{100}$.) Why do people often use percents instead of fractions? (Note: Comparing percentages is often easier than comparing fractions.)

Any percentage can be put as a decimal fraction. (For example, 27 percent is the same as .27) Why do people often use percents instead of decimal fractions?

Ask students to estimate: What percentage of the day do you spend in school? With friends? Sleeping? Eating? Watching television? Doing homework?

- Add up the percentages. If the total is more or less than 100 percent, why?

What do these expressions mean?

- "We're behind you one hundred percent!"
- "I feel a hundred percent today."

Some rock groups receive "a percentage of the gate" at a concert. What does this mean? (Note: A certain percentage of all money received in ticket sales.)

Math Facts

$25\% = \frac{1}{4}$

$50\% = \frac{1}{2}$

$75\% = \frac{3}{4}$

$100\% =$ One whole

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INFINITY FACTORY

Program 102

Mapping and Scaling

Helpful Materials

Assorted maps, preferably including local street maps, road maps for the state and nation, and newspaper weather maps.

Main Math Ideas

How to read maps

Using maps to plan routes

Before the Program

Some questions to think about:

- Have you ever used a map to keep from getting lost?
- What are some other reasons people use maps?

Song

Say, brother, do you know where you're going?
Say, sister, do you know where you're at?

Once you get it together,
There's nothing you cannot do.
Once you know where you're going,
No one can stop you but you.

Always map it out, man,
Before you make a move;
That makes it so much easier
To get yourself in the groove.

Some Highlights

Scoops' Place: Sister Stokes uses a map to plan the parade route for the Youth Service Day march and rally.

Brownstone: To help Hector reach his appointment on time, the children draw him a map.

City Flats: Planning a camping trip, the group draws maps of the area around the campsite so no one will get lost.

Brownstone: Michael, Nancy, and Zach are lost on a street corner because their map is out of date.

Animation: Mapman rescues lost travelers by showing them how to read a map.

After the Program

Have students sketch a rough map of the school building and a few blocks around it.

- Where are the doors to the building?
- Are there trees?
- On what side does the sun shine in the afternoon?
- Are there buildings that block the sunshine?
- Where is the nearest playground?

What would you change around the school?

- Where would you put stores, a hospital, an ice cream parlor?
- What would you place outside the classroom windows?

Suggest that students draw maps to show their routes from home to school.

For students: Draw a map of a wooded area for a camping trip.

- What symbols do you need?
- Which way is north?
- Where are the trees? The lakes? The waterfall?

Have students draw a map of an imaginary neighborhood, using colors to represent different features:

- Bodies of water -- blue
- Wooded areas, parks -- green
- Fire stations -- red
- Houses
- Apartment buildings
- Office buildings
- Stores
- Libraries
- etc.

Tangents

Discuss with students:

In a Brownstone segment, Nancy, Zach, and Michael are lost because their map is out of date. The street they are looking for does not appear on their map.

- Apart from new streets, what are some other reasons maps have to be changed?
- Can old maps ever be useful?
- How often should map companies check their maps?

In Scoops' Place, Sister Stokes uses a map for the parade route to City Hall. According to Jay, "Everyone knows how to get to City Hall."

- Why are maps sometimes important even for people who know their way?
- What can maps tell you, aside from how to get where you are going?

In City Flats, Joey did not want to go camping because his mother could not afford to buy his equipment for the trip. Could he have gone camping without buying equipment? Can you plan a camping trip using available equipment from around the house or neighborhood?

In an animation piece, Mapman helps lost travelers by pointing out landmarks on the map.

- What are some landmarks in your neighborhood? In your state? In the country? In the world?
- How do different kinds of landmarks appear on maps?
- How might people who make maps use landmarks?

Discuss with students: Imagine a city map the same size as the actual city. Would there be problems in using it?

Other Suggestions

Have students bring in a weather map from the newspaper. What do the various symbols mean? From the map, can students tell what the weather is like in different parts of the country?

- Save weather maps for several days in a row, and point out the gradual changes in weather across the country from day to day.

Using a road map, have students find the numbered route that runs nearest the school.

- Where does this route lead?
- Do other maps show how long the route is, end to end?

What information that does *not* appear on a road map might someone need for a car trip?

Math Facts

$7 \times 3 = 21$

$21 \div 3 = 7$

$3 \times 7 = 21$

$21 \div 7 = 3$

Notes

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INFINITY FACTORY

Program 103

Graphs

Helpful Materials

Graph paper

Main Math Ideas

Graphs are useful for recording and looking at information, because . . .

Graphs can clearly show a visual relationship between two variables.

Some Highlights

Animation: A caterpillar uses coordinates to find a leaf on a graph.

Scoops' Place: Donna uses a graph to show that she runs fast enough to be on the boys' track team.

City Flats: Apple draws a wrong conclusion about a graph of the store's daily profits.

Before the Program

Some questions to think about:

- Have you ever had to keep a record of anything for a long time? How did you do it?
- Can you think of people who keep daily records? (Weather forecasters, storekeepers, doctors, athletic coaches, kids interested in baseball, etc.) How do they record information?
- Does anyone know what a graph is? (Write the word on the board.)

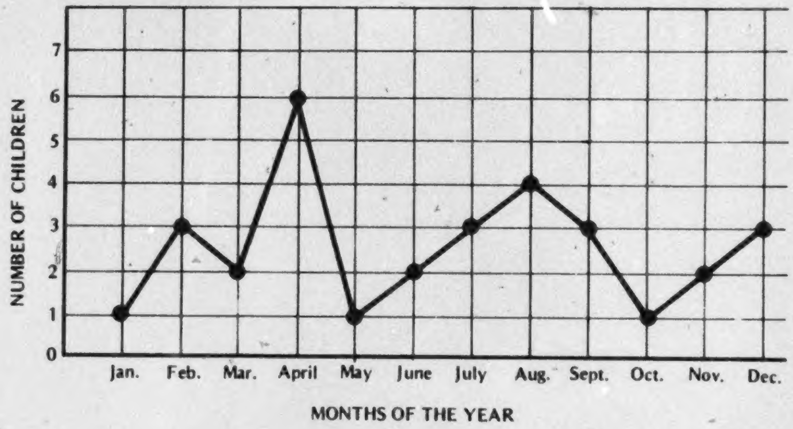
After the Program

How many people in the class were born in November? In July?

Suggest to the class that they make a graph like the one below.

Some questions to think about:

- In which month were the most people born?
- What are some of the things that this graph does not tell you about children in the class? (Does it tell what day of the month people were born, or the ages of people in the class?) What else doesn't it tell you?



Ask students how many hours of television they watch each day. Have them plot this information on a graph over one or two weeks, day by day.

Math Facts

6 x 7 = 42

42 + 7 = 6

7 x 6 = 42

42 + 6 = 7

Other Suggestions

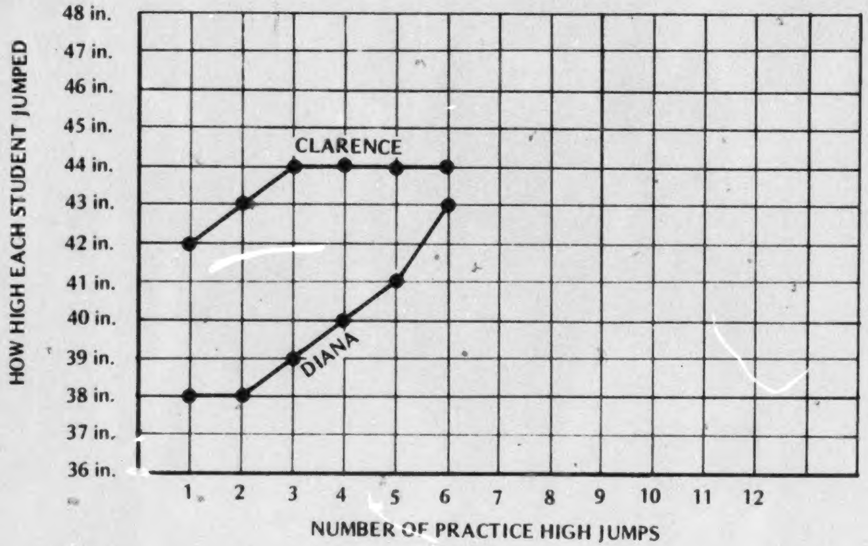
Diana and Clarence were practicing high jumps. They used a graph to record how high they jumped each time.

Some questions to think about:
- Who jumped the highest?
- Who improved the most?
- Who may be jumping higher after a lot more jumps?
- What are some things this graph does *not* tell you?

A student can do several standing long jumps and make a graph that shows his or her progress.

Have students bring graphs to class from magazines and newspapers. Select some interesting ones to look at in class and discuss.

There are many graphing games, such as tic-tac-toe played on coordinate points rather than spaces. Check with your curriculum supervisor concerning other graphing games.



Tangents

Can students think of ways that graphs might keep them out of trouble?

Notes

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INFINITY
FACTORY

Program 104

Negative Numbers

Helpful Materials

Scissors – to cut out paper slide rule

Main Math Ideas

Negative numbers to express debts

The concepts of "zero" and "below zero"

The numberline; negative numbers on the numberline

Before the Program

Some questions to think about:

- What does it mean to be "in the red"? To be "in the hole"?
- What is the smallest number you know?
- Are there any numbers smaller than zero?
- Suppose the temperature is 10 degrees one evening and drops 20 degrees overnight. What is the temperature in the morning?

After the Program

(See back of sheet.)

Some Highlights

Math-In-The-Street: "What's a negative number?"

Brownstone: How long is a numberline?

Animation: A little boy jumps along a numberline to add 4 + 5, and to subtract 4 – 6.

City Flats: Apple's raspadas company finds itself "in the red" due to the rising cost of supplies.

Math-In-The-Street: "What is zero?"

Scoops' Place: Gregory finds himself "below zero" by giving away ice cream to customers in Scoops' store.

Song

I got those negative number blues;
I got less than nothing to lose.

Some folks think that zero
Is as low as you can go,
But I learned the hard way
That it just ain't so.
'Cause those negative numbers
Go right on down the line,
Past zero on forever,
Into infinite time.

I got those negative number blues;
I got less than nothing to lose.

Tangents

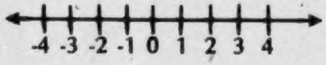
Some questions for students:

In Scoops' Place, Scoops says to Gregory, "If you worked all your life, you couldn't buy a friend." Do you agree?

In City Flats, Apple tries to pull the raspadas business out of the red by raising the price from 15 cents to 20 cents. Do you think this will work? (Do students realize that raising the price may reduce how many raspadas the children sell? You might point out that this problem occurs in nearly every business.)

Suppose negative numbers had never been invented. How would we be handicapped?

There is usually an arrow at each end of a numberline:



What do you think the arrows mean?

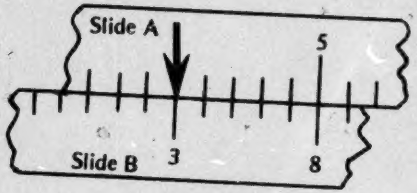
Math Facts

3 x 9 = 27
9 x 3 = 27

27 ÷ 3 = 9
27 ÷ 9 = 3

Notes

Directions. To add 3 + 5:
- Place the arrow on slide A over the 3 on slide B.
- Find the 5 on Slide A; the answer is right underneath it.

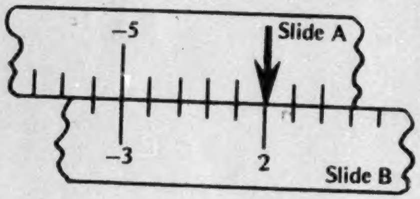

Slide A
5
Slide B
3
8

This is one kind of slide rule.

Students may want to make longer slides to handle bigger and smaller numbers. (Here the numbers are 1 cm apart.) Students can use number slides to find these answers:

7 + 1 =
9 + 1 =
7 + 2 =
3 + 6 =
0 + 8 =

Directions: To subtract 2 – 5:
- Place the arrow on slide A over the 2 on slide B.
- Find the –5 on Slide A; the answer is right underneath it.


–5
Slide A
–3
2
Slide B

Students can use number slides to find these answers:

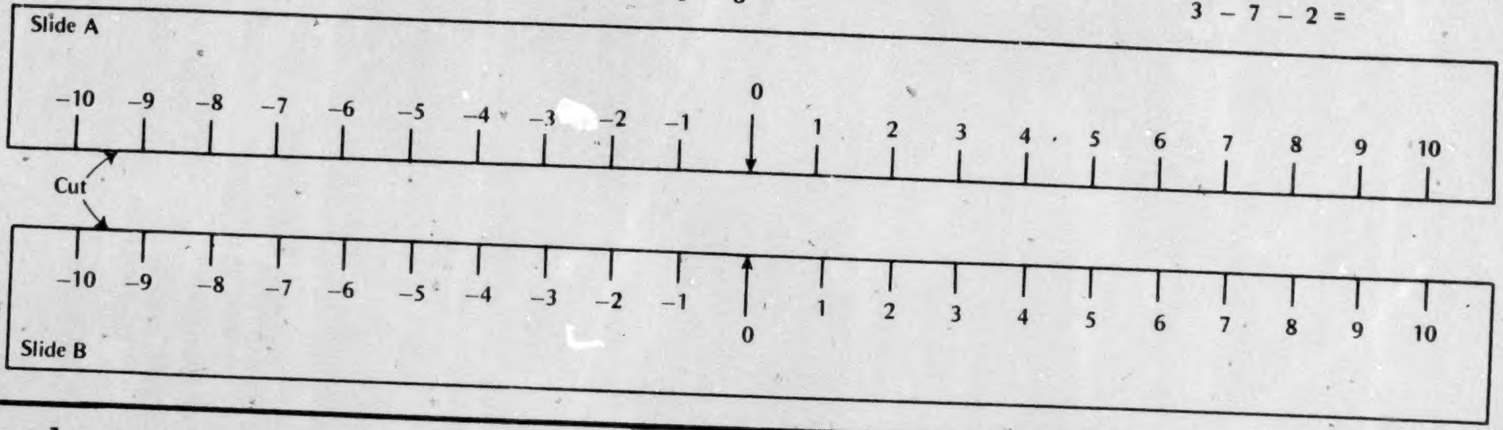
2 – 6 =
10 – 8 =
5 – 7 =
3 – 7 =
0 – 8 =
1 –10 =

What about these?

10 – 8 + 3 =
2 – 6 + 5 =
3 – 7 – 2 =

After the Program

Students can use two numberlines like those at the bottom of this page to add both positive and negative numbers. Have them carefully cut out the rectangles to make two "slides."


Slide A
–10
–9
–8
–7
–6
–5
–4
–3
–2
–1
0
1
2
3
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Cut
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Slide B

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INFINITY FACTORY

Program 105

Decimal Fractions

Helpful Materials

Scissors – for cutting paper

Ruler or yardstick and masking tape – to find fraction points

Meter stick – to find fraction points for tenths

Main Math Ideas

Comparing the sizes of fractions

Some equivalences between fractions and decimals

Before the Program

Some questions to think about:

- How many people are there in half of your class?
- What does it mean if the answer is not a whole number?

How would you divide one dollar among three people?

Song

It's going to take a fraction of my life
To find out where I'm going;
Just a fraction of my life
Before I'll be a knowing;

Like one half of four is two;
What's left you call one half.
Just a fraction of my life.

Some Highlights

Animation: Several examples show the meaning of one half.

Math-In-The-Street: "Which is bigger, $\frac{2}{3}$ or $\frac{1}{2}$?" "How did you figure it out?"

Scoops' Place: Allieboy and Bobby agree to help Ralph Carter (who plays Michael on "Good Times") try to get a $\frac{2}{3}$ vote to pass a referendum for their school.

Animation: $\frac{1}{10}$ and .1 are names for the same fraction.

Brownstone: Danny tells a story about $\frac{1}{2}$ and $\frac{3}{4}$.

City Flats: Joey learns that $\frac{1}{3}$ is smaller than $\frac{1}{2}$.

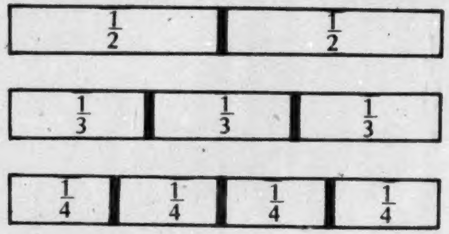
Brownstone: Michael wins an election by gaining $\frac{2}{3}$ of the vote.

In a Brownstone skit, Danny told this story about two fractions trying to sit on a park bench:

> ". . . One day little one-half was just sitting on a park bench, enjoying the day. It was a beautiful day. Along comes a big, boasting three-fourths, and says, 'Hey, little one-half, that park bench just isn't big enough for both of us.' Well, little one-half says humbly, 'I am afraid there is only one half of the park bench left. If you can fit, you're welcome to sit.' Now I don't need to tell you that three-fourths is much bigger than one-half."

Students might enjoy drawing an illustration for the story.

After the Program



- Which is bigger, $\frac{1}{2}$ or $\frac{1}{3}$?
- Which is bigger, $\frac{1}{3}$ or $\frac{1}{4}$?
- Which is bigger, $\frac{1}{2}$ or $\frac{2}{4}$?

Ask the class: Suppose you cut a sheet of paper in half, then cut one of the pieces in half again, and one of those pieces in half, and so on, cutting smaller and smaller pieces in half as long as you could.

- How many times do you think you could do this?
- Try it. (Note: About 13 cuts is the maximum. After only ten cuts, the paper is about one thousandth its original size. Twenty cuts would give a piece about one millionth the original size!)

Tangents

Ask students:

- If a piece of wood is two feet long, what fraction of it is half a foot?
- A quarter-dollar is sometimes called two bits. How much is one bit?
- Suppose a two-gallon bucket has one gallon of water in it. Is it half full or half empty?

A song from the program is printed elsewhere on this sheet. Can students add more verses?

Other Suggestions

Put a strip of masking tape along a ruler or a yardstick. Find and mark the points for $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{4}$, $\frac{3}{4}$.

Put a strip of masking tape along a meter stick. Mark the points for $\frac{1}{10}$, $\frac{2}{10}$, $\frac{3}{10}$, and so on.

If $\frac{1}{10}$ names the same fraction as .1, what decimal fractions correspond to $\frac{2}{10}$, $\frac{3}{10}$, $\frac{4}{10}$, and so on? What is the decimal fraction for $\frac{10}{10}$?

Math Facts

$6 \times 6 = 36$
$36 \div 6 = 6$
$9 \times 9 = 81$
$81 \div 9 = 9$

Notes

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INFINITY
FACTORY

Program 106
Decimal Fractions

Helpful Materials

Scissors – to cut out paper slide rule

Main Math Ideas

Meaning of the decimal point

Some equivalences between common fractions and decimal fractions

Before the Program

Ask students:

- Is $15 the same as $.15? (Write these on the board.)
- Is 15 the same as .15?
- Does anyone know what a "decimal point" is?

After the Program

(See back of sheet.)

Some Highlights

Animation: $\frac{1}{10}$ and .1 are names for the same fraction.

Brownstone: .1, .10, and $\frac{1}{10}$ are names for the same fraction.

Scoops' Place: Allieboy adds decimal fractions to find out how many 1.5-volt batteries he needs for his 6-volt radio.

Animation: Several examples show the meaning of one half.

Math-In-The-Street: "What percentage of your body is covered with clothes?"

Brownstone: .005 is another name for $\frac{5}{1,000}$

City Flats: Practicing for a bicycle race, Joey learns the difference between 15 kilometers and 1.5 kilometers.

Brownstone: Zach finds the wrong answer on his calculator because he does not use the decimal point.

Brownstone: .99 is the same as $\frac{99}{100}$

Song

Hey people . . . What's the point of it all?
The point is . . .
You got to know where the point goes.
The point is . . .
You got to know what the point shows.
The point is . . .
To get the point in the right place.
The point is . . .
To know when to move the point a space.
The point indicates
You got part of a whole.
It shows you a fraction,
And leaves you in control.
The point we're talking about is the decimal point.

Tangents

An "odometer" is a device on a car or bicycle that tells how far it has traveled. (Usually it is right under the speedometer.)

- This is the odometer on a brand new car:

  000072

- How far has the car traveled since it was built?
- What do the zeros in the front of the 7 mean?

- This is the odometer on an old car that has been driven for ten years:

  000072

Why does the reading look the same as on the new car? (Note: The car has probably traveled 100,007.2 miles -- but there are not enough places on the odometer to register the "1". The average car travels about 10,000 miles in a year.)

- Someone who needed to measure distances accurately might order a special odometer like this:

  014723

  How far has the car traveled?

In a Brownstone sketch, Nancy says she bicycled to the library and back, and it was uphill all the way. Is this possible? (Note: If the trip is uphill one way, it has to be downhill the other way, even by a different route.)

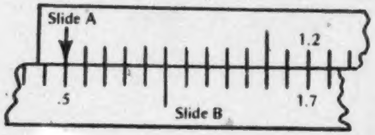
After the Program

Ask students to add 25 cents and 75 cents. Repeat, writing the amounts as $.25 and $.75. Then ask for .25 + .75 -- as numbers, not as sums of money. Try other examples, starting from sums of money and moving to addition of decimal fractions.

- Try examples like 25 + .75, and 25 + 7.50

Students can use two numberlines like those at the bottom of this page to add numbers with decimal fractions. Have them carefully cut out the rectangles to make two "slides." Directions: To add .5 and 1.2:

- Place the arrow on Slide A over the .5 on Slide B.
- Find the 1.2 on Slide A; the answer is right underneath it.

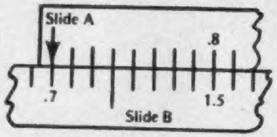


Students can use number slides to find these answers:

.5 + .5 =
.5 + 1.0 =
1.5 + .5 =
.6 + .9 =
1.4 + .4 =

Directions: To subtract 1.5 – .8:

- Place the .8 on Slide A over the 1.5 on Slide B.



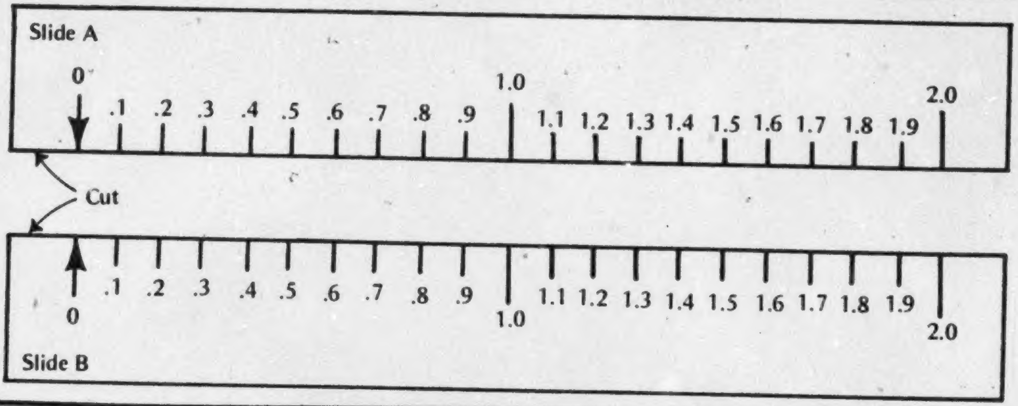
- The answer is right under the arrow on slide A.

Students can use number slides to find these answers:

1.0 – .5 =
1.5 – 1.0 =
1.5 – .5 =
1.6 – .8 =
2.0 – 1.3 =

Point out to students that .25 lies halfway between .2 and .3 -- and so on for .75, 1.25, and 1.75

.25 + .75 =
1.5 – .75 =



Notes

Other Suggestions

In Scoops' Place, Allieboy added 1.5 and 1.5 to get 3.0 -- even though he knew nothing about decimals at the start. How did he know where to put the decimal point? (Note: One way is by approximating. 30 is clearly too big; .3 is too small; but 3.0 is in the right range.)

Math Facts

$.3 = \frac{3}{10}$ $.13 = \frac{13}{100}$ $.7 = \frac{7}{10}$

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Program 107

Approximation

Main Math Ideas

How to round off numbers

Multiplying with rounded-off numbers

Advantages of rounding off when multiplying

Before the Program

Some questions for students:

- Do you ever multiply without using pencil and paper?
- Suppose something costs $6.98, and you need eight of them. Can you find a rough total quickly? How?

Song

Can you round this number to its
closest ten?
Can you round this number to its
closest ten?
'Cause if you have a number, forty-
three, let's say,
Round it off to forty, fifty's far away.
Then take another number, forty-
eight, okay?
Round it off to fifty, forty's far away.
Hey, you, can you round this number
to its closest ten?
Hey, you, can you round this number
to its closest ten?

Some Highlights

Brownstone: "Can you round this number to its closest ten?" A song explains how.

Animation: A caveman rounds off to the nearest hundred.

City Flats: Loli helps Apple figure out if his club can afford to buy jackets by showing him how to round off and approximate the prices.

Brownstone: Hector and Edith approximate how many more hot dogs they will need for their carnival stand.

Scoops' Place: By using multiplication, Irene avoids being cheated.

Animation: A round-off song gives the rules for rounding numbers between 1 and 100.

Brownstone: The children round off to figure out how much money their carnival made on ticket sales.

Documentary: Raoul approximates how much money he can earn by planting and cultivating a row of squash.

Brownstone: The children approximate how much money they might make on their next carnival.

After the Program

For students:

- If you had been given $10 to buy certain things at the grocery store, how could you approximate to find out if you have enough money:

1 dozen apples	$1.39
2 loaves whole-wheat bread	1.10
1 dozen oranges	.89
1 box soap powder	.98
1 half-gallon honey ice cream	1.50
1 can floor wax	1.29
1 package garbage bags	.69
2 chickens	3.60

- Suppose your class is planning a party.
  - What will you need to buy? How many of each item?
  - About how much will each item cost?
  - Roughly, how much money will you need altogether?

Tangents

Ask students:

The children in the program sing, "Can you round this number to its closest ten?" Actually, you round a number to its closest *multiple* of 10. What is a multiple of 10? What are multiples of 20? 25? 100? One?

In a Brownstone skit, Edith and Hector sold 48 hot dogs in one hour. There were five more hours to go, so they had to order more hot dogs. At 48 hot dogs per hour, they figured they would need (48 x 5) hot dogs for 5 more hours. Do you agree? How many more hot dogs would you have ordered?

In Scoops' Place, the salesman says, "When you buy one of something, you have to pay a whole lot more than when you buy a lot of something . . . . The more you buy, the less it costs." What did he mean? (Note: The cost *for each item* is usually less if you buy many at the same time.)

Math Facts

$8 \times 7 = 56$ $56 \div 8 = 7$
$7 \times 8 = 56$ $56 \div 7 = 8$

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Other Suggestions

Some questions for students:

- Do you think banks ever use approximation? Hospitals? Post offices? Airports?
- Salespeople sometimes make a commission on what they sell. (Explain the word "commission.") How can salespeople determine how much money they will make? Do you know anyone who works on a commission basis? What are the advantages compared with a salary? What are the disadvantages?
- Find out the difference in price between subscribing to a magazine and buying it on the newsstand. Use approximation to compare prices. Which is less expensive? Why does the magazine company make it cheaper one way than the other?
- When would it be dangerous for these people to round off numbers and approximate?
  - Surgeon
  - Pharmacist
  - Airplane pilot
- How do you think a restaurant manager knows how much food to buy each day?

Notes

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INFINITY FACTORY

Program 108

Approximation

Main Math Ideas

Approximating by rounding off

Advantages of approximating

Before the Program

Some questions to think about:

- What are some times when an exact answer is not necessary?
- If an item costs $.98, roughly how much would two of them cost? How did you figure it out?

Some Highlights

Brownstone: Can you round this number to its closest 10?

Animation: A round-off song gives the rules for rounding numbers between 1 and 100.

Brownstone: The children round off prices to decide how much they can spend on gifts.

Animation: A caveman rounds off the number 521 to 500 – to the nearest 100.

Scoops' Place: Allieboy rounds prices *up* to figure the most money he will need for party supplies.

City Flats: Loli shows the children how to add their ticket sales by grouping.

Math-In-The-Street: "How much is a million?"

Brownstone: What would you like a million of?

Math Facts

4 x 9 = 36
36 ÷ 4 = 9
36 ÷ 9 = 4
9 x 4 = 36

After the Program

Ask students:

- There are 52 programs in this "Infinity Factory" series, each half an hour long. Round off to find out roughly how many hours it would take to watch all 52 shows, one right after the other.
- How tall are you? Suppose 100 people like you stood on each other's heads; roughly how tall would they all be?
- Each story in an office building is about 12 feet high. Roughly how tall is a 60-story building? About how many of you, standing on each other's heads, would it take to be as tall as a 60-story building?
- How much television did you watch last night? Round off to find about how much television you would watch in a year, if you watched that amount every day.

Song

Can you round this number to its
closest ten?
Can you round this number to its
closest ten?
'Cause if you have a number, seventeen,
let's say,
Round it off to twenty; ten is far away.
Take another number, thirty-three, let's
say,
Round it off to thirty; forty's far away.
Can you round this number to its
closest ten?

Tangents

For students:

Suppose you had six items, each costing under 50¢:

pencil	10¢
ruler	49¢
shoe laces	49¢
rubber bands	25¢
paste	45¢
scissors	49¢

Find the total cost, rounding off each item to the nearest dollar. (Result: Zero.) What is a better way to round off these prices? (Note: Round to the nearest 10¢.)

In Scoops' Place, the children had $15 to spend on a party. Allieboy rounded the cost of each item *up* to the next dollar. Why did he round *up*, instead of rounding *off* to the nearest dollar?

In Scoops' Place, Allieboy disagreed with the adding machine total. Can adding machines be wrong? (Note: The machines are seldom wrong, but people sometimes punch the wrong numbers into the machine.)

In Scoops' Place, Irene rang up a $9.80 charge instead of 98¢, and found a total of $21.20. Could she have found the correct total without adding all the numbers again? (Note: She was too high by $9.80 – $.98, or $8.82.)

A million is a lot, but there is a number much higher called a googol – a 1 followed by a hundred zeroes. Written out, a googol looks like this:

10,000,000,000,000,000,000,000,
000,000,000,000,000,000,000,
000,000,000,000,000,000,000,
000,000,000,000,000,000,000,
000,000,000,000,000

– Can you think of anything you might need to count in googols? (Note: No ordinary situations involve numbers that high.)

Notes

Other Suggestions

Students might be interested in this information:

– A million seconds is about $11\frac{1}{2}$ days.

– A million minutes is about 2 years.

– A million drops of water is about 20 gallons.

– A stack of a million records would reach seven times as high as a 100-story building – a stack about a mile and a half high.

– A million records laid side by side would reach about 190 miles.

(Students can do calculations like these by rounding off.)

There are about 4,000,000,000 people in the world. Suppose the average person is about 5 feet tall. How many miles long would all the people in the world be, end to end? Round off 5,280 feet in a mile. (Note: About 4 million miles – enough to reach all the way around the world 16 times!)

In a Brownstone skit, Danny said: "A million can be too much." What are some things you would not want a million of?

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INFINITY FACTORY

Program 109
Measurement in Meters

Helpful Materials

Foot ruler or yardstick, meter stick, and string – for measurement experiments

Masking tape – for attaching meter stick to wall

Long playing record, cardboard carton, scissors, masking tape, and short stick – for making trundle wheel

Main Math Ideas

Measuring length in meters

Weighing in kilograms

A kilogram as a little over two pounds

Song

Meters are for length; grams are for weight.
If you know the difference, you can control your fate.
Meters of length, grams of weight,
Kilograms, centimeters, then you have millimeters.
Meters are for length, grams are for weight.
And if you know the difference, you can control your fate.
Meters – length; kilograms, centimeters;
Grams – weight; kilograms, centimeters.

Some Highlights

Math-In-The-Street: "Do you know what a meter is?"

Animation: Rita Cheetah, the meter reader, measures with metric units.

City Flats: Apple measures off a soccer field with a trundle wheel.

Animation: A group of animated peanuts use a caliper and ruler to measure their submarine.

Brownstone: Nancy measures to fit a new table into her room.

Animation: Two centimeter worms measure a penny.

Scoops' Place: Metric weights confuse Miss Marie when she weighs her luggage for a trip to Africa.

Brownstone: Zach shows there are 1,000 grams in a kilogram.

Before the Program

Ask students:

- What is a meter (as a unit of length)? When do people use meters?
- What is a kilogram? When do people use kilograms?

After the Program

In ancient times, in some parts of the world, one unit of measure was the cubit: the distance from the elbow to the fingertips. Have three or four children measure the width of the chalkboard in cubits, using their own arms.

- Do their answers agree?
- Why do we no longer use the cubit as a measure of length?

Have students mark a spot on the wall exactly one meter off the floor, and with masking tape attach a meter stick to the wall vertically with its bottom at the mark. Students can use this to find their heights in meters and centimeters.

In many parts of the world, people buy clothing in metric sizes. With a piece of string and a meter stick, children can find some of their clothing sizes in centimeters: waist, neck, head circumference, arm length, and so on.

Ask students:

- About how many kilograms do you weigh?
- About how many kilograms could you lift?
- About how many kilograms does a newborn baby weigh?

(Note: There are about 2.2 pounds to a kilogram – a little over two pounds.)

Tangents

Discuss: At a great deal of trouble and expense, the United States is now starting a changeover to the metric system. Why? (Note: In part, because most of the world already uses the metric system, and the change will make trade with other countries much easier.)

Discuss with students:

- Do you find it awkward to convert with the units we use now – 12 inches per foot, 5,280 feet per mile, 16 ounces per pound, and so on?
- Would you find it easier in the metric system – 100 centimeters per meter, 1,000 meters per kilometer, 1,000 grams per kilogram?
- Why do you think most of the world has already adopted the metric system?

Instead of using inches and fractions of inches, engineers sometimes use tenths of feet and hundredths of feet. Why?

Some questions for students:

- Why do international airlines weigh luggage in kilos instead of in pounds?
- Why are soccer fields measured in meters instead of yards? (Note: Soccer has been most popular in metric countries.)
- Someone who weighs 100 pounds in the United States would weigh about 45 kilos in Mexico. Does this mean he or she loses weight on crossing the border?

While Nancy is carrying her table into the Brownstone, she says, "You can't go by looks. You have to measure it." Is this always true? (Note: Sometimes an estimate is good enough.)

In City Flats, Loli wants to take woodworking instead of home economics. Does your class think this is appropriate?

Zach says, in a Brownstone skit, "Everybody's doing something special." What does he mean?

Math Facts

$63 \div 9 = 7$ $\quad$ $7 \times 9 = 63$

$9 \times 7 = 63$ $\quad$ $63 \div 7 = 9$

Other Suggestions

Students can build a trundle wheel like the one Apple used to measure the soccer field in City Flats. The wheel itself is an old long-playing phonograph record, but the record needs a "tire" about one-quarter inch thick to bring its circumference up to one meter. Cut strips of cardboard from an old carton, and then tape one or two layers around the wheel to form the tire, making it close to a quarter-inch thick. Make a clear mark at the edge of the wheel, put a stick through the hole, and check the wheel by rolling it along a meter stick, starting at the mark. Add or remove cardboard until one full turn of the wheel covers one meter. Students can use the wheel to measure any convenient distance in meters.

Notes

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INFINITY FACTORY

Program 110
Measurement in Meters

Math Facts

6 x 6 = 36
36 ÷ 6 = 6
9 x 9 = 81
81 ÷ 9 = 9

Helpful Materials

Meter stick (if available) and string – for measuring

Scissors, and ruler or yardstick – for measuring and cutting string to metric lengths

Chalk – for marking off distances

Main Math Ideas

An introduction to metric units of length

A sense of how long one meter is

Conversion between meters and centimeters

Before the Program

FOR THE TEACHER:

A meter is about 39 inches long.

One hundred centimeters make up one meter; a centimeter is a little under half an inch.

One thousand meters make up one kilometer; a kilometer is a little over half a mile. It takes about ten minutes to walk one kilometer.

Using a meter stick, if available, have students find something in the classroom roughly one meter long, wide, or high. Instead of a meter stick, students can use a piece of string 39 inches long.

Have students find an object about one centimeter long, wide, or high.

Notes

Some Highlights

Brownstone: Nancy converts meters to centimeters.

Math-In-The-Street: "Do you know what a meter is?"

Scoops' Place: Discussing a track event, Donna describes a meter to Sugar Pie.

Animation: A fish uses an odometer to travel 3,000 meters – three kilometers.

Math-In-The-Street: "How long is a meter?"

Animation: Brief history of the meter; length of a meter in terms of familiar objects.

City Flats: Chuy measures off 100 meters for a race.

Animation: Rita Cheetah, the meter reader, measures with metric units.

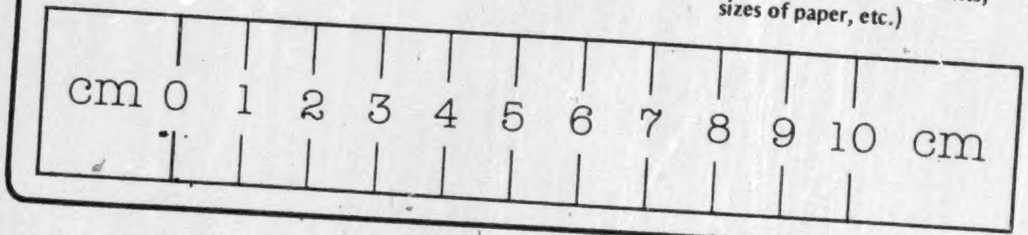
After the Program

Printed on this sheet is a ten-centimeter scale. Have students cut it out; they can use it ten times to measure off a piece of string one meter (100 centimeters) long.

- Ask students: How many centimeters long is the one-meter string?
- Have each student find places on his or her body that are one meter apart, and places half a meter apart.
- Can students find an object in the room that is close to one meter long, wide, or high?
- Which student can find an object closest to one centimeter in size?

Some questions for students:

- Suppose you went to school in Mexico, where everyone uses the metric system. What are some things you would have to know?
- Suppose the United States suddenly changed to the metric system overnight.
  - What problems might we expect? (Note: For example, the speed laws would suddenly change.)
  - What are some things we would have to change? (Note: Mileage on road maps, carpet measurements, sizes of paper, etc.)
- What are some things people would likely measure in centimeters? In meters? In kilometers? (Note: For example, picture frames in centimeters, lumber lengths in meters, taxi fares by the kilometer.)
- How might these people in our country be using centimeters, meters, or kilometers now? And which units might they use?
  - Olympic track runner
  - Map maker
  - Pattern maker (for clothes)
  - Mechanic for foreign cars
  - Astronaut
  - Scientist



Remind students that every measurement of length must have a unit!

Tangents

The program says, "A meter is a unit of length." Cut a piece of string any size; announce it is a new unit of measurement, one "sprow" long. (Or name the unit after the school, or after a child.) Using the piece of string, measure objects in "sprows."

- Have students discuss the disadvantages of making up their own units, especially for communicating with other people.
- Inform students that each nation used to have its own system of units, and discuss the disadvantages.
- By the end of this century, the whole world will probably be using the metric system. What are the advantages in everyone using the same units?

How could students measure the circumference of (the distance around) a globe, using a meter stick and a piece of string?

Ask students: Why do you think the metric system is easy to use? (Note: All the units relate by tens, hundreds, etc., making the arithmetic easy.)

Other Suggestions

Have students cut a piece of string 10 meters long (about 11 yards, or use the one-meter string ten times). Outdoors, use this ten-meter string ten times to chalk off two points 100 meters apart.

- How long does it take to walk 100 meters?
- About how long would it take to walk 1,000 meters (one kilometer)?
- About how many kilometers could you walk in an afternoon?

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INFINITY FACTORY

Program 111

Estimation of Length and Quantity

Helpful Materials

Ruler – for measuring body parts

Bag of uncooked rice, quarter-teaspoon measuring spoon, measuring cup – for estimating grains of rice

Main Math Ideas

Estimation as a rough measurement

Estimating length with parts of the body

Estimation as a rough count

Techniques for estimating quantity

Some Highlights

Math-In-The-Street: "About how far is it from New York to California?"

Animation: Esteban estimates a length by pacing off.

Brownstone: Edith, Jeannie, and Nancy find different results when they estimate the length of a picture.

Animation: Using their body lengths, a group of peanut pirates measure the distance to a buried treasure.

City Flats: Apple, Loli, and their mother use a scale to estimate the number of chocolate squares in a basket.

Documentary: A Puerto Rican craftsman estimates lengths with his fingers as he makes masks from coconut shells.

Math-In-The-Street: "About how many hairs on your head?"

Scoops' Place: Nate Bowman and Dave Stallworth of the New York Knicks help Allieboy estimate ten feet -- the height for a basketball hoop.

Brownstone: For a contest, Danny and Nancy estimate the number of apartment buildings in the neighborhood.

Animation: About how many hairs on a dog? Two fleas estimate.

Song

About how long will it take?
About how high should it go?
About how wide should we make it?
If we estimate, we'll know.
That's what estimation's all about;
That's what estimation's all about.

Before the Program

Ask students:

Without using a ruler, how could you . . .

- Find out roughly how wide a picture is?
- Place a basketball hoop about ten feet above the floor?

Does anyone know what "estimation" means? Write the word on the board.

After the Program

Have students use a ruler to measure these parts of their bodies:

- length of hand
- width of closed hand
- width of outstretched fingers
- length of foot
- width of foot

Suggest that students estimate the length of some objects by using the parts of their bodies measured above.

- Do different parts of each student's body give similar results?
- Do different students find similar results?
- Have students discuss how accurate this technique is. For example, how much difference in results is reasonable?
- When might this kind of estimation be useful?

With this technique, students can estimate the number of grains in a bag of uncooked rice:

1. Count the grains in a level quarter-teaspoon of rice. Round off the result to the nearest ten grains.
2. Count the level quarter-teaspoons of rice it takes for a fluidounce of rice. Then calculate: About how many grains in the fluidounce?
3. Count the fluidounces it takes for a cup of rice. Calculate: About how many grains in the cup?
4. Count the cups of rice in the bag. Calculate: About how many grains in the bag?

Tangents

The program says there are about 100,000 hairs on the human head. Does this mean there are about this many hairs on *every* human head? Do students know people who probably have fewer hairs? Who may have more hairs?

- About how many hairs do students think there are in the human beard? In the human moustache?
- To arrive at the figure 100,000 someone must once have estimated the number of hairs on the head. How do you think he or she went about doing it?

In a Brownstone skit, Nancy and Danny estimate the number of apartment buildings in thirty blocks by counting the buildings in one block, and then multiplying by thirty.

- Suppose the block they chose for counting had more buildings than most blocks, or fewer buildings. How would this affect their final estimate?
- How should they decide which block to use for counting? (Note: The block should have a typical number of buildings -- about the same number of buildings as most of the blocks in the neighborhood.)

In Scoops' Place, the basketball players, Nate and Dave, estimated the height for a basket in two ways: from the height of an upstretched arm, and by holding Allieboy up on the wall. If these two estimates had given different results, how could Nate and Dave have decided which is the better estimate? (Note: This will depend on which information is known more accurately -- the height of the arm, or Allieboy's height.)

Other Suggestions

Here are some answers to estimation questions. What are some questions that might give these answers? Try to obtain several for each.

- 3,000 miles
- 10 feet
- 184 frisbees
- 10 inches
- 150 automobiles
- half an inch
- 3 feet
- 4 miles

Math Facts

6 x 9 = 54
9 x 6 = 54

54 ÷ 6 = 9
54 ÷ 9 = 6

Notes

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INFINITY FACTORY

Program 112

Estimation of Quantity and Length

Main Math Ideas

Estimating length and quantity using available information

Usefulness of estimation in solving real problems

Before the Program

Some questions for students:

- About how wide is your smile?
- What are some things about eight feet long?
- Have you ever estimated how many of something without counting each one? How did you do it?

Some Highlights

Animation: Esteban estimates a length by pacing off.

Brownstone: The children realize that estimation is not exact enough for building a platform to dance on.

Animation: A group of peanut characters estimate how long a pole they need to catapult a soldier up to the tower where their king is imprisoned.

City Flats: Joey, Apple, and Chuy estimate how high they can throw a glider by figuring the height of a tall pole.

Math-In-The-Street: "About how long is your arm?"

Documentary: Children estimate in making costumes for a Mexican festival, Day of the Dead.

Animation: A little girl estimates her chickens before they hatch.

Scoops' Place: Scoops, Miss Marie, and Sister Stokes estimate whether Scoops' Place can hold 45 people for a meeting.

Animation: About how many hairs on a dog? Two fleas estimate.

After the Program

Suggest that students estimate how many of these there are in the school:

- Students
- Teachers
- Bells
- Fire alarm boxes
- Desks
- Doors
- Clocks
- Windows

(Note: For example, to estimate the number of students in the school, students can first estimate the number in one classroom, and then multiply by the number of classrooms.)

Have students estimate lengths of several objects in the classroom. Measure to see who comes closest.

In Scoops' Place, about 45 people attended the church meeting in the store. Ask students:

- If there were no chairs, and all the people stood, about how many could have attended? (Note: One method is to find out how many people can stand in the space where one person sits. Students might seat someone in a chair, draw a chalk line around the space he or she takes up, and see how many people can stand comfortably in that space. Then, multiply by the number of people sitting.)

Tangents

In City Flats, Apple says that Chuy's "rough" estimate means that he doesn't know how high the glider flew. Discuss with students:

- Was Apple right? Is making an estimate the same as not knowing the answer?
- Chuy estimated the glider flew about 23 or 24 feet high. Suppose the exact height had been 25 feet. Would Chuy have been wrong? (Note: It is usually not fair to call estimates right or wrong, but they can be better or worse. Chuy's estimate would have been a good one.)
- Suppose Chuy "estimated" that the glider flew 3,000 feet high, when it actually flew only 25 feet high. Would that have been a good estimate? (Note: This would be a very bad estimate.)

Ask students: What are some times you could not find an exact answer, and estimated instead?

- What are some times when you needed an exact answer, and an estimate would not have been good enough?

Some people estimate in their work. Discuss with students:

- A fireman usually knows the length of his tallest ladder. When he sees someone at the window of a burning building, how does he decide whether the ladder is tall enough to reach?
- A pilot knows that his or her airplane needs a certain length of runway to land safely. Approaching an airport, does the pilot estimate the runway length from the air? (Note: No; an estimate may not be good enough here. The pilot would check the maps, or talk with the airport controller by radio.)
- Do experienced cooks always measure their ingredients? Why is it usually a good idea for beginning cooks to measure carefully?

Math Facts

8 x 9 = 72 72 ÷ 9 = 8

9 x 8 = 72 72 ÷ 8 = 9

Other Suggestions

Ask students to estimate: Suppose four children stood in a line with outstretched arms and their hands touching; how long would the line be? Have them try it and see.

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INFINITY FACTORY

Program 113

Angles

Helpful Materials

Soda straws and straight pins – for making shapes

Main Math Ideas

An angle as an amount of turning

Sizes of certain angles: 90 degrees, 180 degrees, 360 degrees

Some uses for angles

Before the Program

Discuss with students:

- What is an angle?
- What is a right angle?
- Can students find angles in the classroom?

Some Highlights

Brownstone: Hector demonstrates angles on a pool table.

Scoops' Place: Gregory shows how he uses angles in karate.

Brownstone: Michael shows Zach how to use the corner of a book to measure right angles.

Documentary: Three young people learn how to build a geodesic dome out of pipes.

City Flats: Diana uses angles to teach a dance class.

Brownstone: Zach uses angles to show Danny a dance step.

Song

You can move your system
One hundred eighty degrees.
And if you dig the rhythm,
Try three hundred sixty with ease.

Ninety's really moving –
Give it a try.
There are angles to infinity –
Think and you'll know why.

Gotta get the angle
On this brand new dance.
Don't be afraid to tangle,
Just give it a chance.

Get the angle; give it a try.

After the Program

Have students make these angles using their bodies:

- 90 degrees (a right angle)
- 180 degrees (a straight line)
- 45 degrees (half a right angle)
- 360 degrees (a circle)

Ask students to draw pictures of buildings that have *no right angles.* From their pictures, can students see why most real buildings use so many right angles?

How might these people use angles in their work?

- choreographer
- ship navigator
- architect
- baseball player
- photographer
- map maker
- clothing designer
- trapeze artist
- pool player

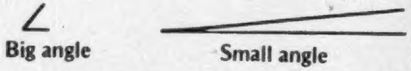
Use angles to describe the route from your home to school.

Using the face of a clock, have students answer these questions:

- At 3 o'clock, what angle do the clock hands form?
- At 6 o'clock?
- At 12 o'clock? (Note: Zero degrees or 360 degrees)

What angle does the minute hand turn through every 15 minutes? Every half hour? Every hour?

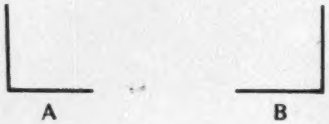
Tangents



Discuss: The smaller angle looks bigger in some ways, but involves a smaller turn.

In Scoops' Place, Gregory said, "In karate, you have to cover all the angles." What did he mean?

In a Brownstone skit, Zach used the corner of a book to draw a 90 degree angle. What else could he have used?



If A is a right angle, does that mean that B is a left angle? (Note: No.)

The program talks about right angles. Are there any wrong angles?

Math Facts

3 x 8 = 24
8 x 3 = 24
24 ÷ 3 = 8
24 ÷ 8 = 3

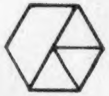
Other Suggestions

Have a student use angles to show the class a dance step.

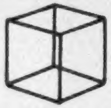
Have students use the song lyrics elsewhere on this sheet to choreograph a dance.

In the piece about a geodesic dome, the young people saw that a three-sided figure is rigid, while a four-sided figure is not. Students might enjoy trying the experiment themselves, and some other experiments as well:

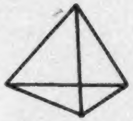
- Take three soda straws, flatten the ends, and push straight pins through the ends to make a triangle. With four straws, make a square. Which is sturdier?
- Take the square, flatten it a little into a diamond, and add another straw across the short diagonal. Is the shape rigid? What simpler shapes now make it up?
- Make a six-sided figure out of soda straws and pins. Add straws that connect at the center, as shown. How many of these center straws are needed to make the shape rigid? When all are in place, what simple shapes make up the overall figure?



- Try the experiment in three dimensions by making these two shapes (cube and tetrahedron). Which is rigid? Why?



Cube



Tetrahedron

- Students can make more complicated shapes, and can experiment with ways to make them rigid.

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INFINITY FACTORY

Program 114

Measurement of Time

Helpful Materials

Stopwatch (or a wristwatch with a second hand), thread, and small weight – to build a pendulum

Paper cup – to make a water clock

Two candles the same size – to make a candle clock

Main Math Ideas

Need for measuring time

Minutes and seconds as units of time

Before the Program

Some questions to think about:

How do you know when it's time to . . .

— — get up in the morning?
— — leave for school?
— — eat lunch?
— — eat dinner?
— — do your homework?
— — go to bed?

If you don't have a clock, how can you tell how long 30 seconds is?

Some Highlights

Math-In-The-Street: "If you don't have a clock, how do you know what time it is?"

Scoops' Place: Prettyboy realizes the importance of telling time when he is dropped from Kung Fu class for being late too often.

City Flats: Loli, Apple, and Tito have to measure time when baking a cake for Mama Lupe and Don Julio's anniversary.

Math-In-The-Street: "How long is a while?"

Animation: The face of a clock is used to show the importance of the minute hand.

After the Program

Some questions to think about:

How might these people measure time in their work?

— — Nurse
— — Baker
— — Track star
— — Photographer
— — Chemist
— — Musician
— — Television producer
— — Radio disc jockey
— — Ceramist
— — Aircraft controller
— — Pilot
— — Astronaut

The class might enjoy building a seconds pendulum. Take a piece of thread about 4 feet long and tie a small weight to the end. Tie the thread to something so the weight hangs down exactly 39 inches. It will take just about a second for the pendulum to swing from right to left. Check with a watch to see if 60 swings take a minute. If the pendulum is too slow, shorten the thread and check the timing again. Always use short swings back and forth.

Children can estimate seconds fairly accurately by counting, "One thousand one, one thousand two, ... " Check 60 of these counts against a watch.

Other Suggestions

Set up a race in the classroom and have students use a stopwatch (or watch with a second hand) to record each person's time.

How long can someone stand on one foot with eyes closed? Have students time each other.

Signal the class to start estimating, and tell each student to say "Now" when he or she thinks 30 seconds is up. How much do people disagree?

Make a tiny hole in the side of a paper cup near the bottom. Cover the hole with your finger while you fill the cup with water. Then measure the time it takes for the water to run out. How could you use this as a clock?*

Teacher demonstration: Using two candles of the same size, burn one and measure its length every ten minutes. Mark these lengths on the other candle. How can the second candle serve as a clock?*

---

*At one time, these were the best clocks available.

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Tangents

Can the class figure out a way to use the sun for telling time?

If you use the sun to tell time, what happens on a rainy day?

Math Facts

2:40 is the same as 20 minutes to 3.

5:35 is the same as 25 minutes to 6.

Three-quarters past 5 is the same as 5:45.

10:45 is the same as a quarter to 11, or three-quarters past 10.

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INFINITY FACTORY

Program 115

Averages

Main Math Ideas

The average as a particular "middle number"

Information missing from an average

Before the Program

Discuss with students:

- What does it mean to be "better than average" at doing something?
- Is anyone in the class exactly average in some way?
- What is an "average"?

Some Highlights

Brownstone: A song explains how to find an average.

Scoops' Place: An insurance salesman tells Scoops that the average man his age is likely to get sick, but Scoops insists the average has nothing to do with him.

City Flats: Diana realizes that a salesman's claim for the average gasoline mileage of a car may be different from the average mileage in her own driving.

Math-In-The-Street: "What's an average?"

After the Program

Explain to the class how to find an average, using small numbers. For example, to find the average of 2, 3, 5, and 6, add them up to get 16, and divide by 4 (because there are four numbers). The average is 4. Point out that the average falls somewhere between the highest and lowest numbers.

Suppose four students watched these amounts of television one evening:

Hector	1 hour
Nancy	2 hours
Zach	4 hours
Jeanie	5 hours
TOTAL	12 hours

What is the average time the four watched television?

Choose ten students, and have each report how long he or she watched television last night (rounded to the nearest hour). What is the average time the ten watched television? Choose ten students, and ask each how many brothers or sisters he/she has. What is the average number of brothers and sisters among the ten?

- The result may not be a whole number; for example, the average might be $1\frac{3}{10}$ brothers and sisters. What does three-tenths of a person mean? Does anyone actually have three-tenths of a brother or sister?

How might these people use averages in their work?

- baseball player
- pediatrician
- people who sell insurance
- teacher
- football coach
- people who sell cars
- truck driver
- newspaper editor

Discuss these questions with students:

- Suppose you know that four people have an average weight of 80 pounds. Do you know anything about each person's weight? About whether their weights are similar or different? About whether *everyone* in the group is very light or very heavy?
- Would you rather be close to the average, or very different from the average? (Note: Appropriate answers will vary; there are many kinds of averages.)

Students might enjoy finding the average age in the class, and the average height. (Are any students at the average height?)

Ask students: Suppose you know that a student's class has an average height of $4\frac{1}{2}$ feet. How tall do you think the student is?

Tangents

Is there any such thing as an average person – someone who is exactly average in every way? If not, what do we mean by an "average person"?

- Discuss with the class: People often mix up the words "average," "normal," and "typical." These mean different things. For example, the *average* family has $1\frac{9}{10}$ children. A *typical* family might have two or three children. A *normal* family could have no children at all, or any number up to a dozen or more.

- Almost nobody is exactly average. But a lot of people are typical, and almost everybody is normal.

If somebody says, "That movie was average," what does he mean? How does this relate to the mathematical meaning of "average"?

Math Facts

21 ÷ 3 = 7   3 x 7 = 21

21 ÷ 7 = 3   7 x 3 = 21

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Other Suggestions

Have students calculate the averages of numbers like these:

0, 0, 0, 4
0, 0, 0, 40
0, 0, 0, 400

Point out that changing just one number will change the average.

Have students find the average height of the boys in the class, and the average height of the girls. If the boys are taller on the average: Does this mean every boy is taller than every girl? (Vice versa if the girls are taller on the average.)

- Compare these two averages with the average height for the whole class. (Note: The whole-class average should come between the boys' average and the girls' average.)

Many advertisements use averages – average number of dishes a container of liquid detergent will wash, average coverage from a can of paint, average life of a light bulb, and so on.

- Ask students to bring in examples of advertising that mention averages.
- Discuss how well the claims apply to a particular purchase.

Ask students: Could you dive into a lake whose average depth is two feet?

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INFINITY FACTORY

Program 116

Multiplication

Helpful Materials

Ruler or thin string – to use nomogram on this sheet

Main Math Ideas

Multiplication as repeated addition

Some uses for multiplying

A way to multiply by nine with fingers

Some Highlights

Animation: Multiplying can be faster than adding the same number over and over again.

Math-In-The-Street: "When was the last time you multiplied?"

City Flats: Joey shows a shortcut for multiplying by nines using his fingers.

Scoops' Place: Using multiplication, Gregory avoids being cheated by a shoelace salesman.

Math Facts

4 x 6 = 24 24 ÷ 4 = 6
6 x 4 = 24 24 ÷ 6 = 4

Before the Program

Some questions to think about:

When was the last time you multiplied?

What is multiplication good for?

After the Program

(See back of sheet.)

Other Suggestions

What would you multiply to find . . .

- How far is it around a baseball diamond? (Note: A baseball diamond is a square, 90 feet on each side.)
- How many squares on a checker board? (Note: There are eight squares along each edge.)
- How many seconds in an hour? In a day?
- How many hours in a week? In a year?

If a student is going to the store to buy everything needed for a class party, how might he or she use multiplication?

Tangents

The program showed how to multiply by nine using all ten fingers: To multiply 3 x 9, for example, fold down the third finger from the left. The two fingers remaining to the left stand for 20, and the seven fingers to the right for 7, showing the answer is 27. Can students use this method to develop a technique for dividing by nine? Can they use it to discover which numbers (up to 90) are exactly divisible by nine?

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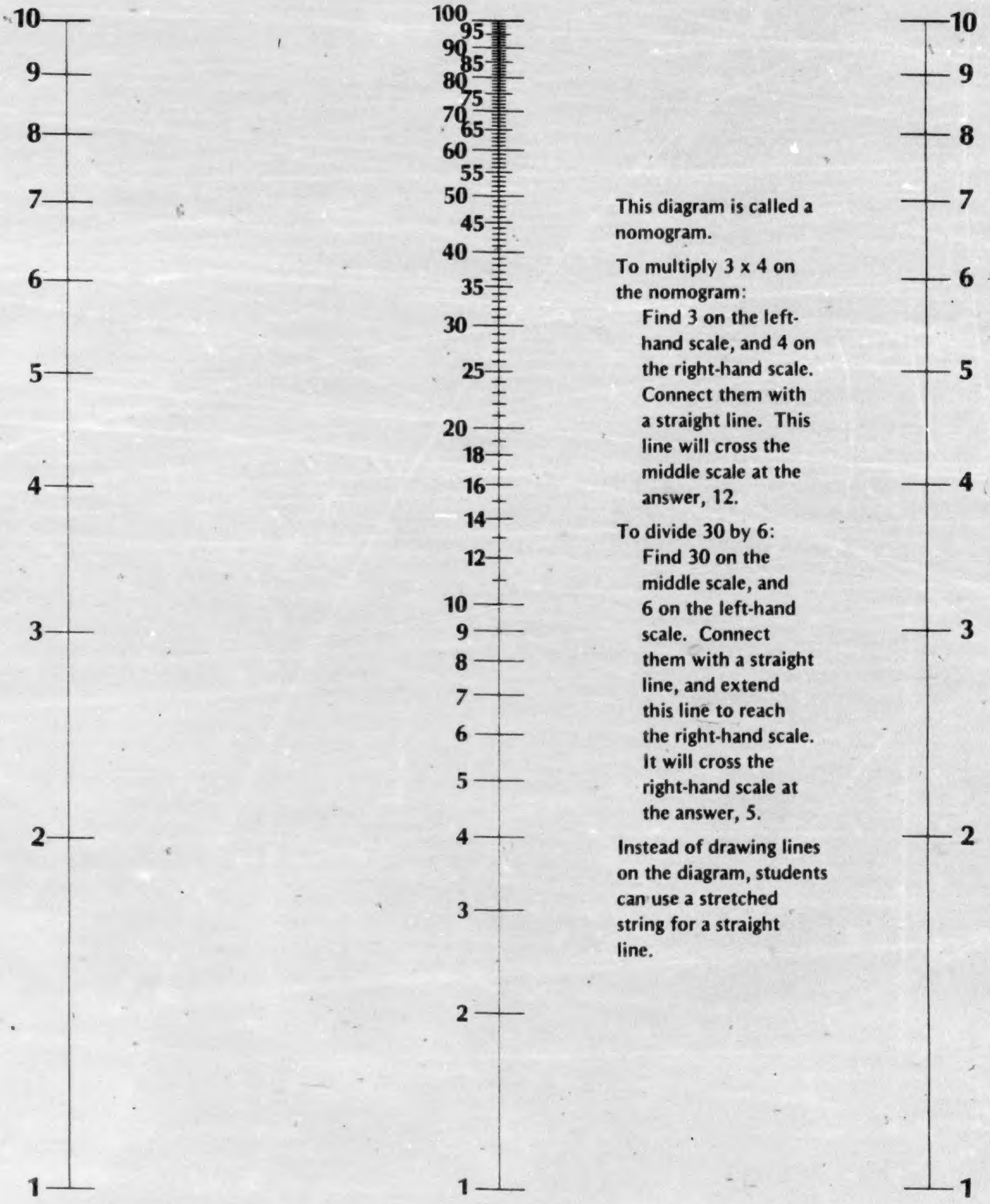
After the Program



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1

This diagram is called a nomogram.

To multiply 3 x 4 on the nomogram:

Find 3 on the left-hand scale, and 4 on the right-hand scale. Connect them with a straight line. This line will cross the middle scale at the answer, 12.

To divide 30 by 6:

Find 30 on the middle scale, and 6 on the left-hand scale. Connect them with a straight line, and extend this line to reach the right-hand scale. It will cross the right-hand scale at the answer, 5.

Instead of drawing lines on the diagram, students can use a stretched string for a straight line.

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INFINITY FACTORY

Program 117

Fractions

Helpful Materials

Scissors – to cut out paper slide rule

Main Math Ideas

Some equivalences between common fractions and decimal fractions

Comparing the sizes of fractions

Some uses for multiplying decimal fractions

Before the Program

What are some times when you have to divide things in halves? In fourths? In thirds?

What are some times when people use decimal fractions?

After the Program

(See back of sheet)

Some Highlights

Animation: Several examples show the meaning of one half.

Animation: $\frac{1}{10}$ and .1 are names for the same fraction.

Scoops' Place: Allieboy adds decimal fractions to find out how many 1.5-volt batteries he needs for his 6-volt radio.

Math-In-The-Street: "Which is bigger, $\frac{2}{3}$ or $\frac{1}{2}$?"

City Flats: Apple learns that calculators use decimal fractions.

Song

It's going to take a fraction of my life
To find out where I'm going;
Just a fraction of my life
Before I'll be a knowing.

Like one half of four is two;
What's left you call one half.
Just a fraction of my life.

Tangents

In City Flats, Apple says about a calculator, "With a machine like this, who needs to study math?"

- Do students agree? (Note: Calculation is a very small part of mathematics. And to use a calculator, people must know which arithmetic operations to perform, and on what numbers. Calculators cannot solve problems; they can only help people solve problems a little faster.)

In City Flats, Tudy says, "Calculators are only as good as the people who use them."

- What does he mean?
- Do students agree?

An animation piece says, "Half a sandwich is not the same as half a board." Ask students:

- Why not, if they are both a half?
- If two halves make a whole, why don't half a sandwich and half a board make a whole something?

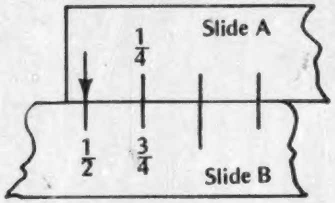
(Note: This is exactly the same issue as two apples being different from two oranges.)

After the Program

Students can use two numberlines like those at the bottom of this page to add halves and fourths. Have them carefully cut out the rectangles to make two "slides."

Directions: To add $\frac{1}{2}$ and $\frac{1}{4}$:

- Place the arrow on Slide A over the $\frac{1}{2}$ on Slide B.
- Find the $\frac{1}{4}$ on Slide A; the answer is right underneath it.



This is one kind of slide rule.

Students can use fraction slides to find these answers:

$\frac{1}{4} + \frac{1}{4}$

$\frac{1}{2} + \frac{1}{2}$

$\frac{3}{4} + \frac{1}{4}$

What about these?

$1 + \frac{1}{4}$

$1\frac{1}{4} + \frac{1}{2}$

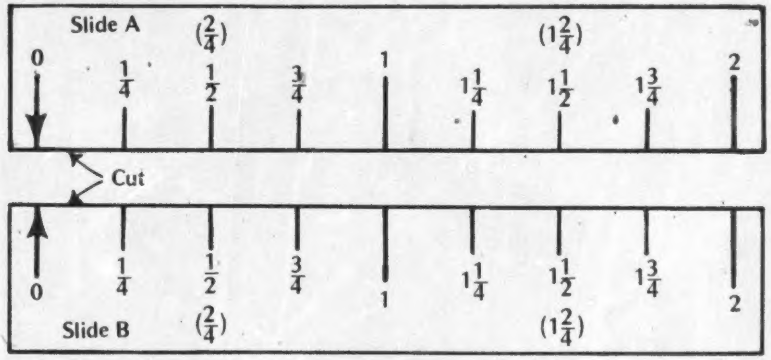
$\frac{1}{4} + 1\frac{1}{4}$

$\frac{3}{4} + 1\frac{1}{4}$

$1\frac{1}{4} + \frac{3}{4}$

$1\frac{3}{4} + \frac{1}{4}$

Can students figure out how to subtract fractions with the slide rule?



Other Suggestions

These are lines from a song in the program:

"Like one half of four is two;
What's left you call one half."

Students might enjoy illustrating these lyrics. (Note: One way is to draw pictures and shade in fractional parts.)

Discuss with students:

- When the song says, "One half of four is two," does it matter what there are four of, and two of?
- Suppose you had four different pictures, and cut each in half. Would the four halves make two whole pictures? (Note: The result would still be four half-pictures.)
- Four half-quarts of milk *would* be the same as two whole quarts. Why does this work with quarts of milk, but not with pictures?

Ask students: Why do calculators use decimal fractions instead of having keys for all the fractions? (Note: Because a single decimal-point key makes it possible to punch in *any* fraction.)

Math Facts

$\frac{3}{4} = .75$

$\frac{1}{4} = .25$

$\frac{1}{2} = .50$

$\frac{5}{10} = .50$

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INFINITY FACTORY

Program 118

Problem–Solving

Main Math Ideas

Estimation as a tool for making everyday judgments about "how many" or "how much"

Some uses for multiplying to solve problems

Before the Program

Some questions to think about:

- When was the last time you multiplied to solve a problem?
- What are some things you could buy with a total cost of $5? (Who can come up with the longest list of different items?)

After the Program

(See back of sheet.)

Tangents

In a Brownstone segment, Danny says, "A dollar probably wouldn't mean much to a millionaire."

- Do students think this is true?
- How much money do they think *would* matter to a millionaire?

In the piece about peanuts riding in a dirigible: The pilot estimated that each peanut "child" weighs 30 kilograms -- about 66 pounds. Ask students:

- Is this a reasonable weight for a peanut? For a child?
- Would every one of the "children" weigh exactly 30 kilograms?
- Suppose the pilot's estimate were wrong, and the children weighed more than 30 kilograms each. What would happen?
- Would the pilot be better off having too many children in the dirigible, or too few? (Note: Too few. With too many, the dirigible might be too heavy to fly properly.)

Some Highlights

Brownstone: The children name some things they could buy for $5.

Animation: Peanut workmen estimate how many bricks they need to pave a walk.

Math-In-The-Street: "When was the last time you multiplied?"

City Flats: Using estimation, the children realize that their benefit car wash is in trouble.

Animation: A peanut character estimates how many children his dirigible will hold.

Scoops' Place: Scoops, Miss Marie, Max, Gregory, and Sugar Pie estimate whether they can afford to hire Barry White for a church benefit concert.

Other Suggestions

Suggest that students think through the planning for a concert to raise money.

- How much would it cost to use a theater or auditorium? (A few phone calls might provide this information.)
- About how much would the performers cost? (Students may have to guess.)
- Are there any other expenses -- for example, publicity?
- What is the total estimated expense for the concern?
- How much money must the concert raise? Adding this to expenses: What is the total amount that ticket sales should bring in?
- How many seats are there in the theater? What should each ticket cost, in order to bring in the total amount needed?
- Would people be willing to pay that ticket price? If not, what changes can make the ticket prices more reasonable?
- Is it safe to plan on filling the theater? If not, how many tickets should students plan on selling?

(People who plan real concerts go through much the same kinds of thinking.)

Math Facts

8 x 7 = 56
7 x 8 = 56
56 ÷ 8 = 7
56 ÷ 7 = 8

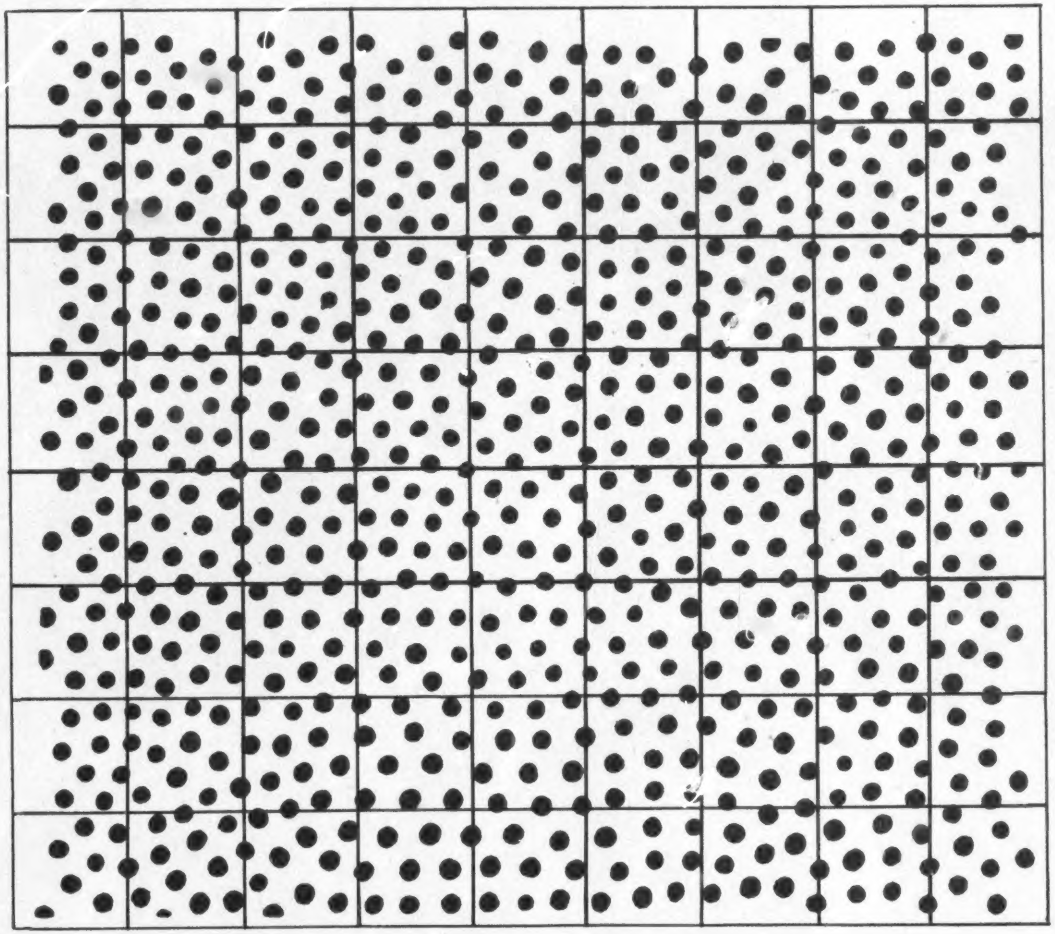
After the Program

Students can estimate the number of dots on this sheet by using this technique:

- Pick a typical square -- a square with about the same number of dots as most squares.
- Count the dots in the typical square.
- Count the number of squares in each row, and the number of rows; multiply to find the number of squares.
- Multiply the number of dots in a typical square by the number of squares. This gives a first estimate for the total number of dots.
- If many squares are not typical, having many dots or few dots, adjust the estimate accordingly.

Repeat the process above, starting from a square with a few dots, to get a low estimate. Repeat again from a square with many dots for a high estimate. Does the original estimate fall between these two?

(Note: One rough estimate for the number of dots is about 800.)



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INFINITY FACTORY

Program 119

Measurement of Weight and Volume

Helpful Materials

Measuring cup, half-gallon juice container with straight sides, and piece of string – for estimating volumes

Main Math Ideas

Size as an unreliable guide to weight

Technique for estimating liquid volume

Before the Program

Discuss with students:

- Are large things always heavy, and small things always light?
- Suppose you had a large jar, and needed to know how many cups of water it would hold. What are some ways you could find out?

Song

You can't judge a book by its cover.
You can't judge a weight by its size.
One is not the same as the other;
You got to look inside.

You can't tell just by looking.
Don't be fooled by what you see.
And never jump to any conclusions;
Make sure you check things out.

Just take your time, and check things out.

Some Highlights

Brownstone: Danny discovers that a small box can be heavier than a large box.

Animation: A little girl weighs her trunks at the airport.

Scoops' Place: Gregory and Sugar Pie estimate how many men it will take to move the church organ.

City Flats: Helping to prepare the punch for a party, Joey uses a piece of string to estimate whether a large jar will hold 65 cups.

Documentary: A fireman explains how he figures the amount of water used at each fire.

After the Program

When estimating, it is often useful to know these facts:

- One quart of water weighs two pounds.
- One gallon of water weighs eight pounds.

People, animals, and plants consist mostly of water, so these figures roughly apply to living things.

Ask students:

- If a small dog weighs eight pounds, what is its volume? (Note: About four quarts. Students may need help with the idea of a dog's volume in quarts. Suggest that they imagine a plastic bag, the size and shape of the dog, filled with water. Then the volume of the dog is the volume of this water, in quarts.)
- When might you want to know a dog's volume? (Note: For example, when planning to give it a bath.)
- Starting from your own weight, estimate your volume in quarts. (Note: Remind students that a quart of water weighs two pounds.)
- What is your volume in gallons?

Have students estimate the number of cups in a half-gallon. They can pour two cups of water into a half-gallon juice container, measure the height of the water with a piece of string, double the string, and double it again, until the string reaches the half-gallon mark -- keeping track of the number of cups each length of string represents.

Tangents

Using a sketch on the chalkboard, explain that a cubic foot is the volume of a cube that measures one foot along each edge.

- Have students estimate their volumes in cubic feet, starting from their weights and the fact that a cubic foot of water weighs about 62 pounds.

Have students find the volume of the classroom: They can measure and round off the length and width, estimate the height, and multiply all three together in feet to find the approximate volume in cubic feet.

- Suppose the whole classroom were full of water. What would the water weigh? (Note: There are about 62 pounds of water in a cubic foot. The total for the classroom may be surprisingly high.)
- How many students could fit into the classroom, one on top of another? (Note: Students might estimate that each person stands on a patch of floor one foot by two feet, and needs six feet of head clearance, for 12 cubic feet per student.)
- Suppose it were possible to pack students into the classroom very tightly, one on top of another. Starting from the volume of a typical student in cubic feet: How many students could pack into the classroom?

Some questions for students:

- In City Flats, Mama Lupe estimated she would need 65 cups of punch. How do you think she arrived at this number?
- Some food containers are marked with volumes, and some with weights. What are some examples of each?
- In Scoops' Place, Miss Marie thought Gregory and Sugar Pie were getting into trouble. Why? What words did she interpret wrongly? Have you ever been misunderstood because people put the wrong meanings on your words?

Other Suggestions

Dicusss with students:

- Why is it hard to tell how heavy something is just by looking at it?
- Does anyone in the class think they could lift a fish aquarium full of water? (Note: A medium-sized aquarium holds about 20 gallons. At eight pounds of water per gallon, this is about 160 pounds.)

Suggest that students estimate how much water they use each day. The following may be helpful:

- Run a faucet at medium force, and find out how many times it will fill a quart container in one minute.
- Estimate how long you run faucets every day. Roughly how many quarts of water does this represent?
- About how much water do you drink every day?
- A typical bath uses 40 to 50 gallons of water.
- Flushing a toilet uses about 7 gallons.

Different people use different amounts of water. One estimate for the nation is about 100 gallons of water per person each day.

Math Facts

24 ÷ 4 = 6
24 ÷ 6 = 4

6 x 4 = 24
4 x 6 = 24

Notes

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INFINITY FACTORY

Program 120

Measurement of Volume

Helpful Materials

Medicine dropper* – for estimating a milliliter

Measuring teaspoon, small glass, quart and half-gallon containers, and a grease pencil – for estimating a liter

Container, large bowl, and measuring cup – to find the volume of an object

Eight glasses the same size – for making a musical instrument

*For the most accurate results, ask a pharmacist for a "USP dropper."

Some Highlights

Animation: A cat explains that a liter holds a little more than a quart.

Scoops' Place: Irene shows the meaning of a liter in Prettyboy's "secret" formula.

Math-In-The-Street: "What has volume?"

Animation: Making a milkshake, a cat explains there are 1,000 milliliters in a liter.

City Flats: Tudy shows Joey how to measure out a liter as he mixes oil and gasoline for a go-cart.

Documentary: A fire engineer explains how he figures the amount of water used at each fire.

Brownstone: Zach builds a musical instrument by filling eight glasses with certain amounts of water.

Main Math Ideas

An introduction to liters and milliliters

A liter as a little more than a quart

A liter as 1,000 milliliters

Before the Program

Ask students:

- Do you know what "volume" is?
- Do you know what a "liter" is?

After the Program

For the teacher:

- A liter is a little more than a quart – about 34 ounces.
- 1,000 milliliters make up one liter.
- 5 milliliters is about one teaspoon.
- 15 milliliters is about one tablespoon.
- 1 cup is about 260 milliliters.
- 4 liters is a little more than a gallon.

(Note: A liter is about 1.057 quarts.)

Pharmacists estimate that about 20 drops of water make up a milliliter. With a medicine dropper, students can see for themselves how much one milliliter looks like.

- To check a medicine dropper, students can count out drops into a measuring teaspoon. A measuring teaspoon holds just about 5 milliliters, so at 20 drops per milliliter, 100 drops should fill the measuring teaspoon.

The following activity can help students find out roughly how much a liter is:

1. A measuring teaspoon holds just about 5 milliliters. Label a measuring teaspoon "5 ml."
2. Pour off teaspoons of water into a small glass 20 times. At 5 milliliters per teaspoon, this means the glass then has about 100 milliliters of water.
3. With a grease pencil, draw a ring around the glass at the water level; label the ring "100 ml."
4. Fill the glass to the ring, and pour it off into a half-gallon container, ten times. At 100 milliliters each time, this gives about 1,000 milliliters in the container – which is the same as one liter.
5. Pour the estimated liter into a one-quart container. How does the estimated liter compare to a quart?

Discuss with students: What situations might involve these quantities?

- 1 milliliter
- 5 milliliters
- 500 milliliters
- 1 liter
- 4 liters

Tangents

Some questions for students:

- Which is heavier: A pound of lead or a pound of feathers? (Note: They both weigh the same, but their volumes are very different.)
- When a sponge picks up water, its volume seems to stay about the same. How does it hold the water without seeming to increase in volume? (Note: The water fills up little holes in the sponge.)
- What might you want a milliliter of?
- What might you want a liter of?

In the Brownstone skits, Danny was reluctant to try foods new to him, but then enjoyed them when he tried them. Invite students to discuss their experiences in trying foods for the first time – especially foods from cultures other than their own.

Other Suggestions

To find the volume of an object, fill a jar to the brim with water. Carefully place the jar in a large empty bowl. Slide the object into the jar, catching overflowing water in the bowl. The volume of the overflow gives the volume of the object.

Using eight drinking glasses, all the same size, students can make a simple musical instrument. The activity will need someone who knows a little about music.

1. Arrange the glasses in a row, and number them one through eight.
2. Put a little water in glass 1, and tap its rim lightly with a pencil to make it sound. Add water to glass 8 until it sounds an octave higher than glass 1.
3. Add water to glass 3 until it sounds a third higher than glass 1. (If glass 1 is "do," glass 3 is "mi.")
4. Add water to glass 5 until it sounds a fifth higher than glass 1. (Glass 5 is "sol.")
5. Add water to the remaining glasses so all eight sound in a musical scale. (Glass 2 is "re," 4 is "fa," 6 is "la," and 7 is "ti.")

Students can experiment with playing simple songs on the glasses.

Math Facts

$9 \times 8 = 72$

$72 \div 8 = 9$

$72 \div 9 = 8$

$8 \times 9 = 72$

Notes

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